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THE
NATURAL HISTORY
OF
BRITISH FISHES,
INCLUDING
SCIENTIFIC AND GENERAL DESCRIPTIONS
OF THE
MOST INTERESTING SPECIES,
AND AN
EXTENSIVE SELECTION
OF
ACCURATELY FINISHED COLOURED PLATES.

TAKEN ENTIRELY FROM
ORIGINAL DRAWINGS,
PURPOSELY MADE FROM THE SPECIMENS IN A RECENT STATE,
AND FOR THE MOST PART WHILST LIVING.

VOL. II.

BY E. DONOVAN, F.L.S.

AUTHOR OF THE NATURAL HISTORIES OF BRITISH BIRDS,
INSECTS, SHELLS, &c.

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1803.

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OF
BRITISH FISHES.

SCIENTIFIC AND GENERAL DESCRIPTIONS

OF THE

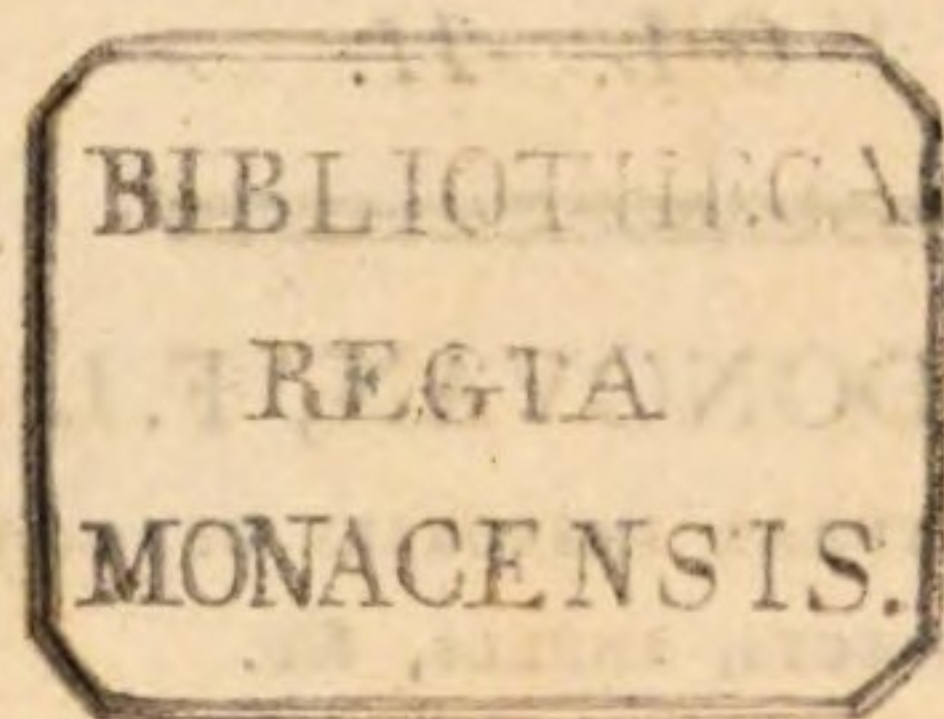
BRITISH FISHES

ACCOMPANIED BY ORIGINAL COLOURED PLATES

FROM THE

ORIGINAL DRAWINGS

THESE PLATES WERE MADE FROM THE ORIGINALS IN A RECENT STATE,
AND FOR THE MOST PART FIRST EDITION.



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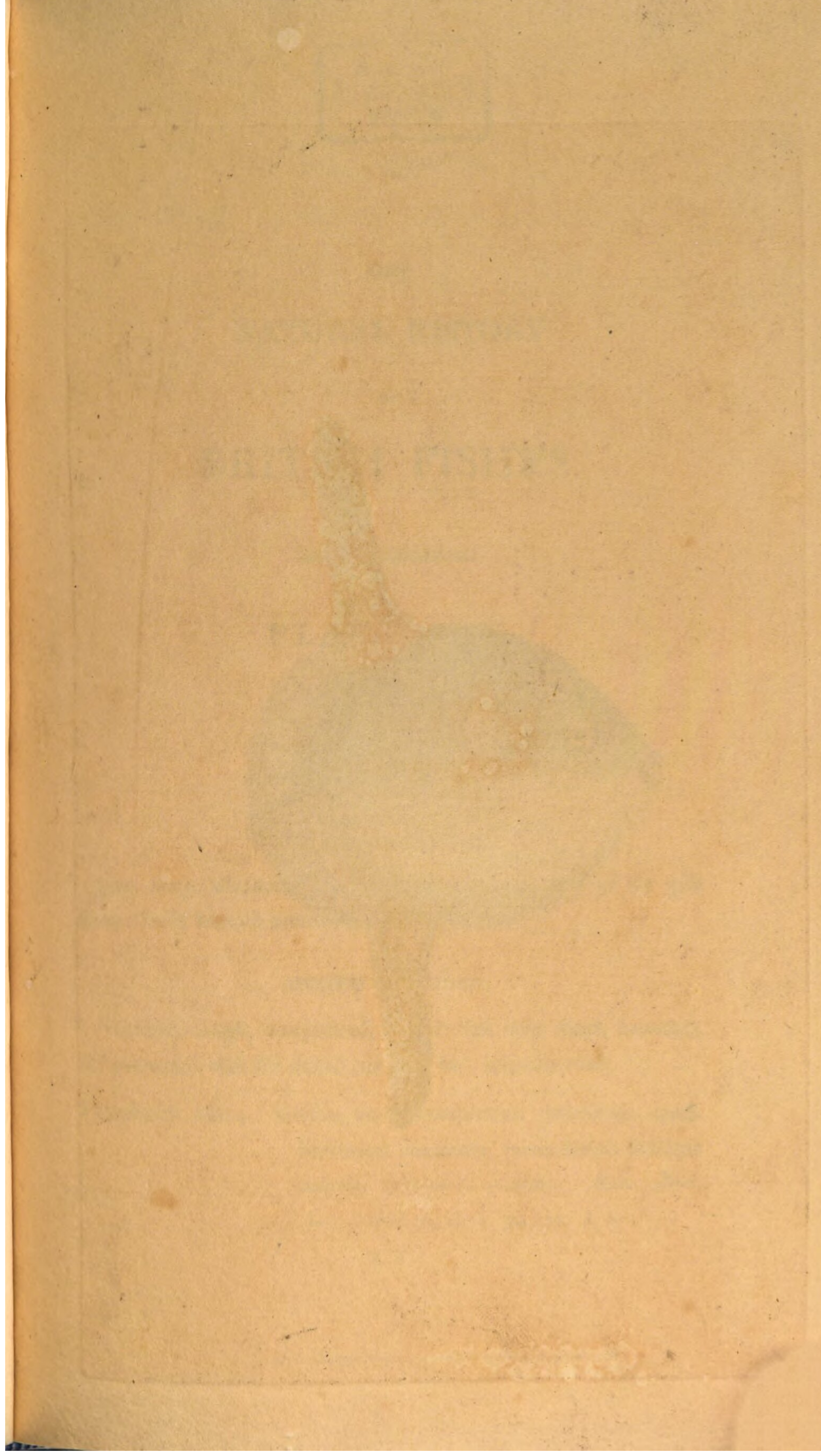
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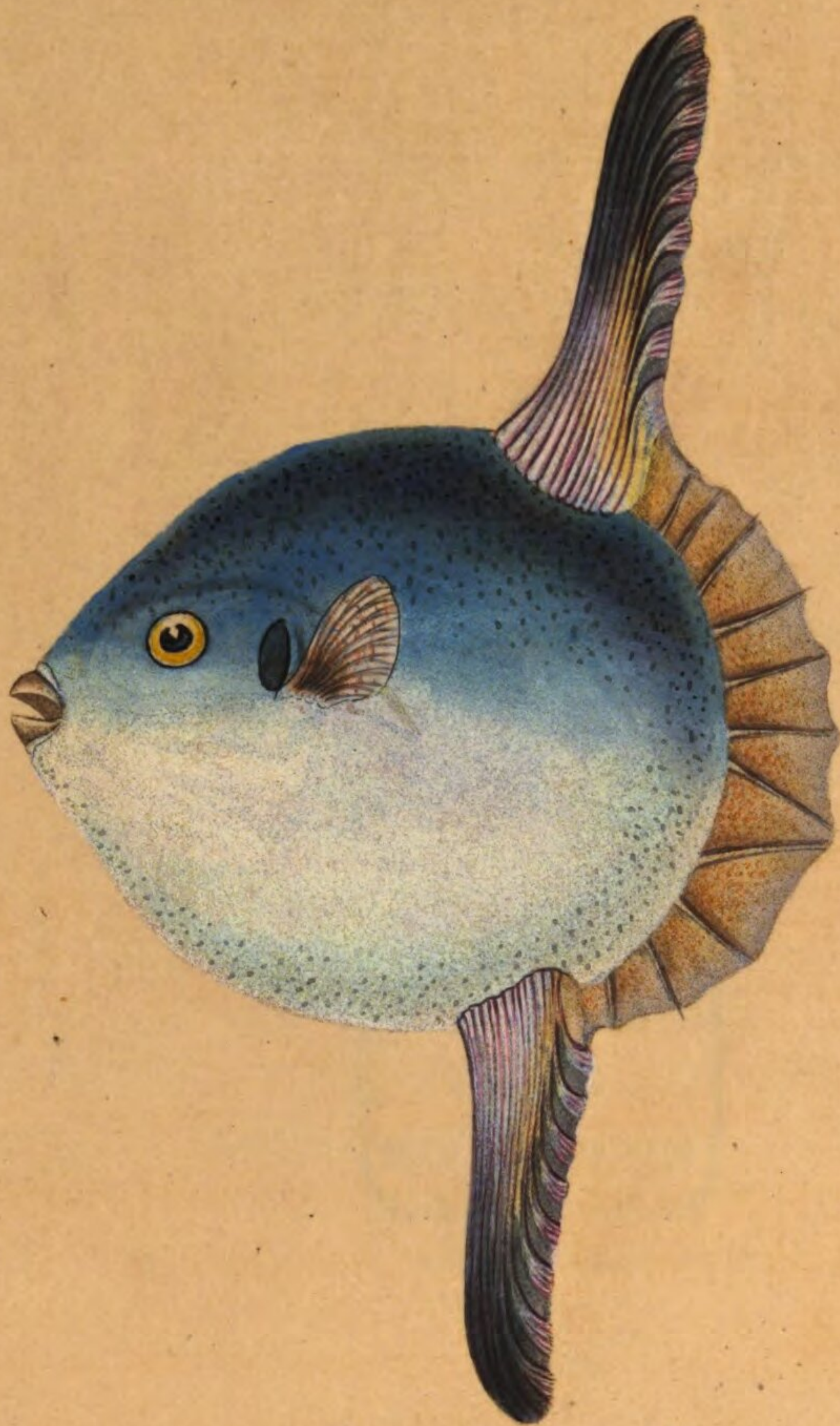
R. AND C. BENTLEY, NEW ST. PAUL'S CHURCH-YARD,

BY THE AUTHOR, ST. JOHN'S SQUARE, LONDON.

1803.

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THE
NATURAL HISTORY
OF
BRITISH FISHES.

PLATE XXV.

TETRODON MOLA.

SUN FISH.

BRANCHIOSTEGI.

GENERIC CHARACTER.

Jaws bony, advanced, divided at the tip: aperture of the gills linear: body beneath muricated: no ventral fins.

SPECIFIC CHARACTER.

Unarmed, rough, compressed, round: tail very short, rounded, and connected with the dorsal and anal fin: spiracles oval.

TETRODON MOLA: inermis, asper, compressus, rotundatus, cauda brevissima rotundata, pinna dorsali analique annexa, spiraculis ovalibus. *Retz. Nov.*

Act. Stockh. 6. 2. 3. p. 111. t. 4.

PLATE XXV.

Mola Salviani, Orthragoriscus, Rondel. Sun-fish, Willughby.

1. t. 26.

Tetrodon lævis, compressus, cauda truncata : pinna brevissima, dorsali analique annexa. Syst. Nat. 12. p. 411. n. 7. Gmelin. Syst. Nat. 1447. sp. 7.

SUN FISH from Loo. *Borlase Cornwall, 267. tab. 26. fig. 6.*

SHORT DIODON, *Penn. Brit. Zool. 3. p. 131. 55.*

In the great scale of animated nature, there are perhaps few creatures of a more extraordinary appearance than the *Tetrodon Mola*, or one more likely to create surprise in the mind of a cursory observer. So remarkable indeed is this appearance, that some might be inclined to doubt the positive existence of a creature so formed, and certainly at the first glance, a slight degree of scepticism in this respect is not only pardonable, but laudable. To those who are conversant with Natural History it cannot be unknown, for descriptions and figures of it have been inserted in several works on the fish tribe, and being by no means unfrequent in the Mediterranean and other European seas, the fish itself may have occurred to the notice of those who reside near the sea shore.

The Germans call this fish *Schwimmendekopf*, and the French *tête nageante*, or swimming head, a name sufficiently expressive of its appearance, which is precisely that of the head and shoulders of some larger fish cut off, and still retaining all the principles of life and vigour.

The first figure given of this fish is supposed to be that by *Salvian*. That of *Pennant* is certainly extremely bad; and another by his

PLATE XXV.

predecessor, Borlase, is nothing better. That even of Bloch has in all apparent probability been copied from an uncouthly stuffed specimen, and instead of exhibiting in its colours some trace of the fine silvery hue of the belly and sides, which is so conspicuous in a recent subject, it is almost uniformly of a dirty blueish colour.

This seems not to have been a very common species on the Cornish coast in the days of Borsale; his figure was copied from one of the Drawings of Mr. Jago: at this time we find that it does appear on the Cornish coast, but not in such plenty as it haunts some shores in warmer climates. This fish grows to the enormous weight of four or five hundred pounds, and proves a valuable capture to the fishermen, when taken, on account of the oil which they extract in great plenty from it: the flesh is of little value, being oily and very rank. It is not common, we believe, on any of our coasts: one that was seen in the Bristol channel about four years ago was deemed a great rarity.

Our figure is copied from an elegant little specimen, which we were assured had been caught near the coast of Brighton. Its form, as represented, is nearly orbicular, and the skin rough with little pustules: in the dorsal fin are thirteen rays: anal sixteen: pectoral twelve: caudal fourteen.

Gmelin with great impropriety makes the oblong Sun Fish of Pennant a variety of this species.

PLATE XXV

but I cannot but say, is nothing better. That even of black has in all
apparent probability been copied from an apparently stuffed specimen,
and instead of exhibiting in its colour and form of the fish, which
has of the belly and sides, which is so conspicuous in a recent subject,
it is almost uniformity of a dirty bluish colour.

This seems not to have been a very common species on the Cornish
coast in the days of Boscawen; his figure was copied from one of the
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rank. It is not common, we believe, on any of our coasts; one that
was seen in the Bristol channel about four years ago was deemed a
great rarity.
Our figure is copied from an elegant dried specimen, which we
were assured had been caught near the coast of England. Its form
as represented, is nearly orbicular, and the skin rough with fine
papules: in the dorsal fin are thirteen rays, anal fin: pectoral
twelve: caudal fourteen.

It is similar with great propriety to the oblong San Eusebio
I found a variety of this species. The greatest was the largest and
the most perfect. It was found in the bay of San Eusebio, and
was the most perfect I had seen. And I found it was the most perfect I had seen.



London Pub^d as the Act directs by E. Donovan & F. & C. Rivington. May 1. 1803.

PLATE XXVI.

RAIA CLAVATA.

THORNBACK.

CHONDROPTERYGII.

GENERIC CHARACTER:

Spiracles ten, five on each side, oblique, and placed beneath, near the neck: head small, pointed, not distinct from the breast, with the mouth beneath, transverse, and toothed: body thin, depressed, and rhombic.

SPECIFIC CHARACTER

AND

SYNONYMS.

Body spinous: teeth tuberculated: a strong cartilage across the abdomen.

RAIA CLAVATA: aculeata, dentibus tuberculosus, cartilagine transversa abdominali. *Linn. Fn. Suec.* 293.—
Gmel. p. 1510. *sp.* 8.

Raja dorso dipterygio aculeis scabro, cauda ordine aculeorum solitario, apice pinnato, rostro acuminato.
Gronov. mus. 1. 140.

PLATE XXVI.

Raja ordine aculeorum unguiformium unico in dorso caudaque.

Bloch. Deutschl. 3. 58.

Raja clavata. Ray, Will. &c.

THORNBACKE. *Penn. Brit. Zool. 3. p. 69. n. 5.*

This common fish, according to Mr. Pennant, is easily distinguished from the other species of Ray, by the rows of strong sharp spines, disposed along the back and tail. The number of those rows are far from constant, and almost every author speak of them differently. In one of a large growth Mr. Pennant found three rows on the back and five on the tail: some mention but three rows on the latter; and others only one. The characters which *Artedi*, and after him Linnæus, have assigned this species, are not free from objection, for as M. Bloch very justly observes they are certainly too general: all the rays having the cartilage across the belly, and many the blunt or tuberculated teeth as in this species.

In respect of colour, it is well known this fish is apt to vary a little. Klein speaks of them having the upper surface marked with round whitish spots, and such as are brought to the London markets answer to this description: Mr. Pennant considers these whitish spots as a character of the young fish, but we have observed them more or less distinct on the largest as well as the smallest specimens that have occurred to our notice; and some of these have weighed twenty or thirty pounds each, if not more.

Like the Skate, the young of this kind are called *Maids*, and are of a better flavour than the old ones. Among naturalists it is gene-

PLATE XXVI.

rally believed, that this fish casts off and renews its large tuberculated spines every year, and that the places from which they have fallen may be easily perceived by the whitish marks that remain in the skin. When the ground colour of the back is a lightish ash, and the round whitish spots are each distinctly encircled with a ring of black, the upper surface of this common fish has a pretty ornamented appearance. The under side is pure white with only a few spines.

The Thornback is taken at most seasons, but in the greatest abundance in the spring and summer, because they approach the shores at those times in vast numbers to deposit their eggs among the weeds. The eggs of these fish bear a strong resemblance to those of the Shark tribe, having a quadrangular, black, and horny shell, but the corners do not terminate in long filaments as in those of the Shark. Like the other kinds of flat fish, the Thornback frequents sandy shores, and feeds on all kinds of small fish and worms, both of the naked and shelly tribes.

The amazing size to which these fish sometimes grow is almost incredible; a ray supposed to be of this species was captured near the island of St. Christopher's, in 1634, that measured twelve feet in length; and Gmelin informs us, that this species does sometimes grow to that size. On the coast of Norway they are taken in vast quantities: the flesh the natives eat, either fresh or salted, and from the liver extract an oil for burning in their lamps, or other domestic purposes. The flesh of the Thornback, is thought, in England, inferior to the Skate, and is not unfrequently sold for it, by the London fish-mongers.

PLATE XXVI

fully believed, that this fish casts off and renews its large scales
 later spines every year, and that the plates from which they have
 fallen may be easily perceived by the whitish marks that appear in
 the skin. When the ground colour of the back is a lightish ash
 and the round whitish spots are each distinctly circled with a ring
 of black, the upper surface of this common fish has a pretty other-
 minded appearance. The under side is pure white with only a few
 faint spots. The young are born in the spring, but in the greatest abun-
 dance in the spring and autumn, because they approach the shores at
 those times in vast numbers to deposit their eggs among the weeds.
 The eggs of this fish bear a strong resemblance to those of the Shark
 tribe, having a quadrangular, black, and bony shell, but the con-
 crete do not terminate in long points as is those of the Shark.
 Like the other kinds of fish, the Thorback frequents sandy
 shores, and feeds on all kinds of mollusks and worms, both of the
 naked and shelly tribes.

The amazing size to which these fish are sometimes grown is almost
 incredible, a ray supposed to be of this species was captured near
 the island of St. Christopher, in 1781, that measured twelve feet
 in length; and George Johnston, an Irish sportsman, once mentioned
 grew to that size. On the coast of Norway they are taken in vast
 quantities, the flesh the natives eat, and the bones are used for
 the liver extract an oil for burning in their lamps. Another domestic
 purpose. The flesh of the Thorback, is thought, in England, in-
 ferior to the Skate, and is not universally sold in by the Lon-
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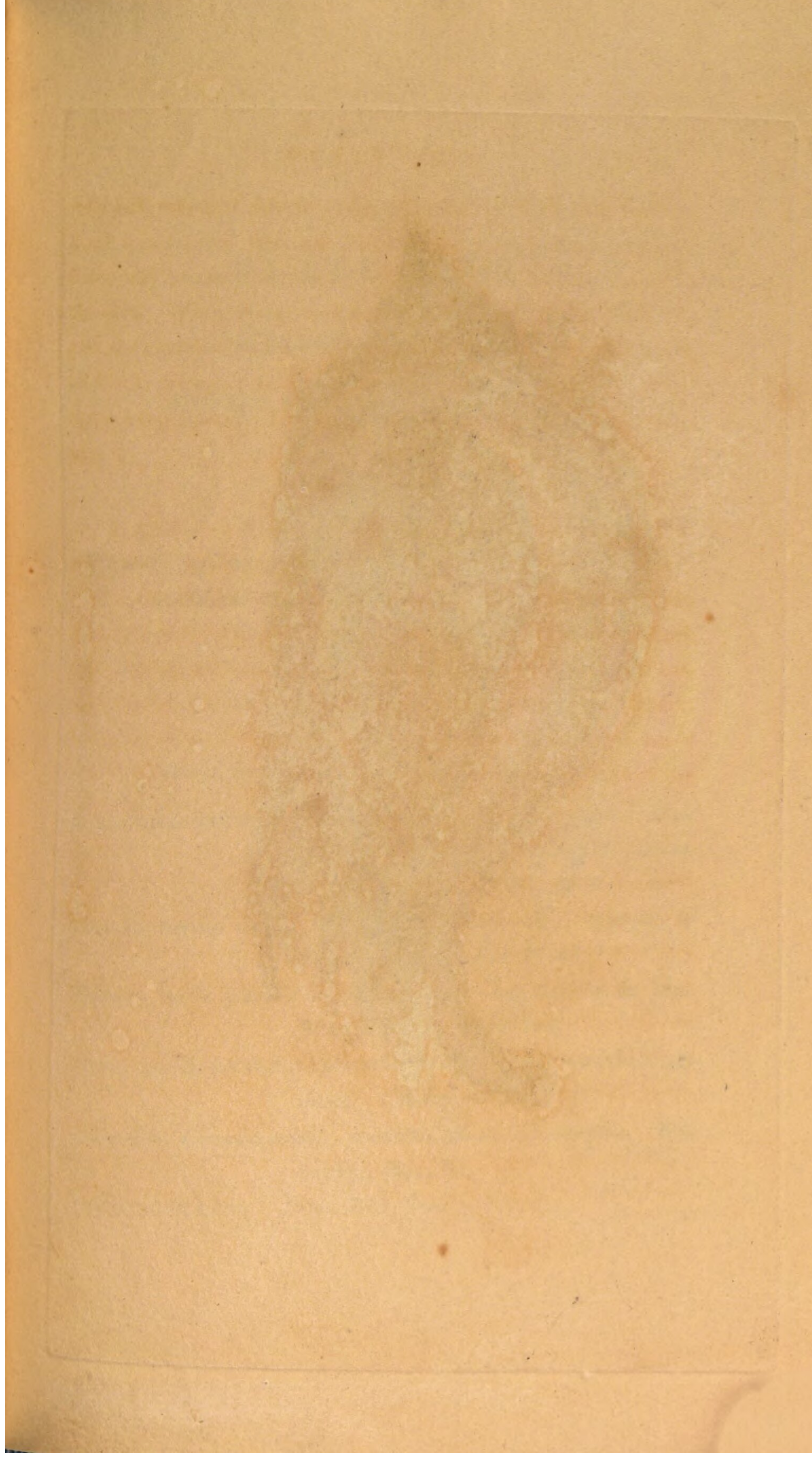




PLATE XXVII.

BLENNIUS GUNNELLUS.

SPOTTED BLENNY, or BUTTER FISH.

**JUGULARES.*

GENERIC CHARACTER.

Head sloping: six rays in the gill-membrane: body lanceolate:
ventral fins of two united rays: anal fin distinct.

SPECIFIC CHARACTER

AND

SYNONYMS.

Dorsal fin with about ten black ocellated spots.

BLENNIUS GUNNELLUS: pinna dorsali ocellis decem nigris. *Mus.*

Ad. Fr. I. p. 69.—Fr. Suec. 318. Linn.

—Gmel. Syst. Nat. 1181. sp. 9.

Blennius maculis circiter decem nigris, limbo albo, utrinque, ad
pinnam dorsalem. *Art. 27. 45.*

Blennius ocellis plurimis in pinna dorsali.—Le Papillon de Mer.

Bloch. Fisch. Deutsch. 186.

Photis maculis annulatis ad pinnam dorsalem, pinnis ventralibus ob-
soletis. *Gronov. mus. I. n. 77.*

Gunnellus Cornubiensium, nonnullis Butterfish—Liparis. *Wil-
lughby, Ray, &c.*

SPOTTED BLENNY. *Penn. Brit. Zool. 3. 210. 93.*

PLATE XXVII.

The Butterfish or Spotted Blenny is sufficiently distinguished by the single row of ocellated spots on the upper part of the back and dorsal fin. The prevailing colour of the body is yellowish brown with the belly white: the former colour varying to a deep ash, or a warm pellucid brown with pale or dark obscure spots, and the whole very prettily mottled. Its form is slender, and much compressed: the length from six, to eight, or sometimes ten inches.

In the dorsal fin of one specimen we found eighty-two rays; in another seventy-seven: in the pectoral fin of one, twelve rays; in another eleven, and in a third only ten: ventral fin usually two rays: anal fin about forty-three; and in the tail from sixteen to eighteen. The number of spots vary likewise; in some they amount only to ten, as Linneus describes it: Pennant speaks of eleven; and in the fish we have figured there are twelve. Fabricius in his *faun. Groenl.* p. 153. describes a variety, which Gmelin calls punctatus β corpore fere lineari fulvo pinna dorsali ocellis quinque nigris, totidemque albis conjunctis:—a kind with a body nearly linear and marked with five black, and as many white ones.

This elegant fish is a native of the North and Baltic Seas, and inhabits some of the rocky shores on the coast of Anglesea, where we have observed it to be not very uncommon among the tang, and under stones below high water mark. It is a lively creature, and as slippery as an eel; the scales being both soft and minute and the body covered with a kind of mucous: when taken in the hand it exerts itself vigorously to regain its liberty, and not unfrequently with success: in the water it is equally if not still more active, and swims with great velocity. Like several other fish of the Blenny tribe, this creature is very tenacious of life, living for two or three

PLATE XXVII.

days after being taken out of the water. Their food consists of marine insects, and the eggs of fish, or their young fry, in search of which it prowls about the crevices of the rocks, and in its turn is devoured by other voracious fishes: the sea gulls, the corvorant, and other birds that haunt the shores are of the number of its enemies, but it is said that none is more formidable to it than the father-lasher, a creature completely armed with spines: of a savage disposition; and which has the same haunts as itself.

The flesh of this species is seldom eaten, being deemed very indifferent, and they are only used for baiting the hooks to take other fishes. We are told that the Greenlanders catch numbers of them, and dry or salt them among others, for their winter provisions.

PLATE XXVIII

days after being taken out of the water. The foot consists of the
fine insect-like legs of the young fly, in which of
which it grows about the crevices of the rock, and in its turn is
driven by other vaporous flies: the gas, the conversion, and
object which the human the character of the growth of its character
but it is said that none is made beneficial to it than the insect-like
a creature completely armed with a set of a winged apparatus
and which has the same habits as itself.

The flesh of this insect is eaten, being deemed very in-
different, and they are only used for feeding the birds to take other
fish. We should also the Christiana which is much of the
and they are the most useful objects for their water protection.

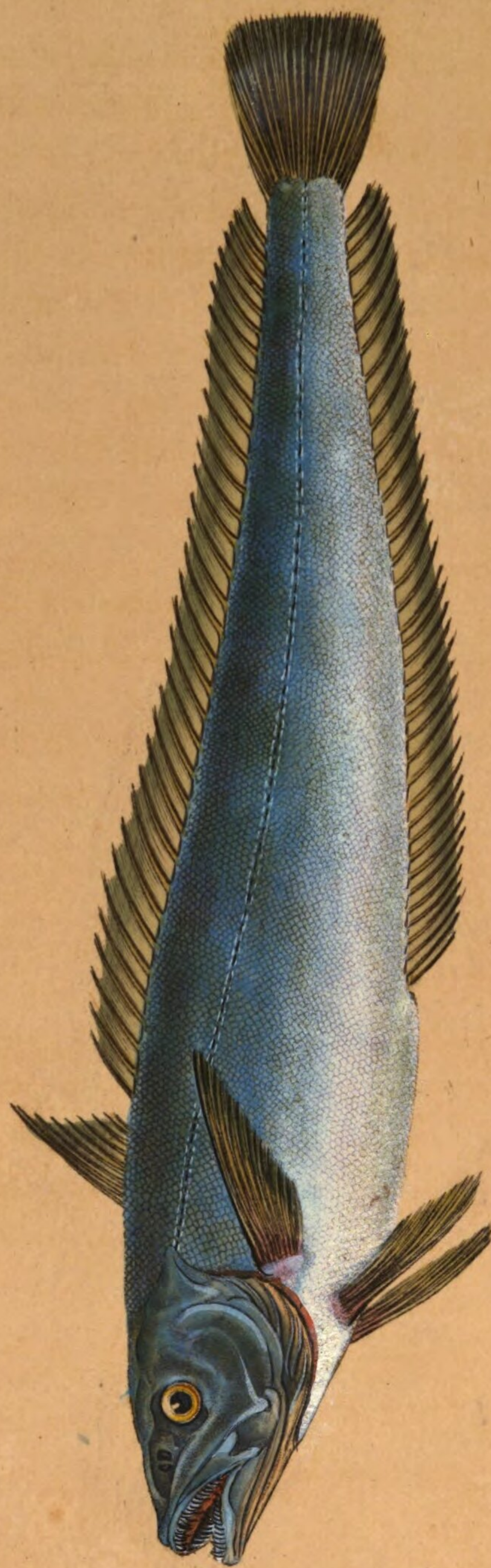


PLATE XXVIII.

GADUS MERLUCCIUS.

HAKE.

* JUGULARES.

GENERIC CHARACTER.

Head smooth. Seven slender rays in the branchiostegous membrane. Body oblong. Scales deciduous. All the fins covered with a skin. More than one dorsal and anal fin: rays unarmed. Ventral fin slender, pointed.

SPECIFIC CHARACTER

AND

SYNONYMS.

Beardless: inferior jaw longest.

GADUS MERLUCCIUS: imberbe, maxilla inferiore longiore. *Linn.*

Mus. Ad. Fr. 2. p. 60.—*Fn. Suec.* 314.—

Gmel. p. 1169. sp. 11.

Gadus dipterygius ore imberbi. *Bloch. Aus. Fisch.* 2. p. 93. t. 154.

Asellus, *Plin. hist. mund.*

Asellus primus. *Will. ichth.* p. 174.—*Ray, pisc.* p. 56.

HAKE. *Brit. Zool.* Vol. 3. p. 156. n. 10.

PLATE XXVIII.

M. Bloch acquaints us in his history of this species, that it may be easily distinguished from the other fishes of the *Gadus* genus by having two fins on the back, and the lower jaw beardless: by both these characters this fish may be perhaps distinguished, but it ought not to escape remark, that this is not the only species which has two fins on the back; the Gmelinian species *Molva*, *Albidus*, *Tau*, *Lota*, *Mustella*, and several others, possess the same character. These are, however, uniformly to be distinguished by having one or more beards on the chin, whilst that part in *Gadus Merluccius*, as Bloch observes, is perfectly smooth.

This fish is a native of the North and Mediterranean seas. It is of the migratory kind, frequenting our shores in immense shoals, during the Mackrel and Herring seasons, appearing for the first time in June, and then again in September, in pursuit of those fish. Mr. Pennant acquaints us that there was formerly a vast stationary fishery of Hake on Nymph Bank off the Coast of Waterford, and that it was no unusual thing for six men, with hooks and lines, to take a thousand Hake in one night, besides a considerable quantity of other fish. The flesh of the Hake, although firm and white, is so little esteemed for its flavour in England, that it is seldom eaten, even by the lower class of people. They are caught chiefly for the purpose of salting and drying them for exportation. Vast quantities, it is said, are sent every year to the port of Bilboa, and other parts of Europe. When cured, it is well known by the name of Poor John, or Stock Fish.

On the coast of France the Hake is also taken in great abundance, and is cured as in England, for exportation. By one of the French writers it has been remarked, that since the great naval engage-

PLATE XXVIII.

ment in 1759, between the French and English, the Hake has been found in vast numbers at all seasons of the year, in the sea that washes the shores of Belle-isle. He conjectures that they were at first attracted principally to this spot, by the number of dead bodies that were here committed to the deep. Some of the Hake on that coast, we are told, measure six or seven feet in length.

The Hake is a most voracious fish, and feeds on the Mackrel and Herring, as before observed: it feeds also on other small fish; on crabs and worms. For its carnivorous mode of life its teeth are perfectly well adapted: they are numerous, strong, sharp, and much recurved, which gives it no small degree of advantage in securing its prey. The eggs found in the body of the female are of an orange colour, and about the size of a grain of millet, as ichthyologists have before mentioned.

The form of this fish is not inelegant: the head is long, and rather depressed. In the first dorsal fin are nine rays; in the second, thirty-eight; pectoral fin fifteen rays: ventral eight: anal thirty-six: and in the tail, eighteen.

PLATE XXVIII.

found in 1733, between the Tropic and Equator, the fish has been found in vast numbers at all seasons of the year, in the sea that washes the shores of Belle-Ile. Its coasts are that they were at first attracted principally to this spot, by the number of dead bodies that were here consigned to the deep. Some of the fish on the coast, we are told, measure six or seven feet in length.

The fish is a most voracious fish, and feeds on the smallest and largest, as before observed: it feeds also on other small fish, on crabs and worms. For an enormous mode of life in tooth and perfectly well adapted: they are numerous, strong, sharp, and much increased, which gives it no small degree of advantage in securing its prey. The eggs found in the body of the female, are of an orange colour, and about the size of a grain of millet, as ichthyologists have before mentioned.

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PLATE XXIX.

CYPRINUS BARBUS.

BARBEL.

ABDOMINALES.

GENERIC CHARACTER

Mouth without teeth: gill-membrane with three rays: body smooth,
and whitish in general: ventral fins usually with nine rays.

SPECIFIC CHARACTER.

Anal fin with seven rays: beards four: second ray of the first
dorsal fin serrated on both sides.

CYPRINUS BARBUS: pinna ani radiis 7, cirris 4, pinnæ dorsi radio
secundo utrinque serrato. *Mus. Ad. Fr.* 2.
p. 107.

Cyprinus maxilla superiore longiore, cirris 4, pinna ani ossiculo-
rum 7.

Cyprinus maxilla superiore, prominente, cirris quatuor ad os. *Bloch.*
BARBEL. *Penn. Brit. Zool.* 3. p. 357.

A common inhabitant of most fresh waters in Europe, and easily
distinguished from the other species of Carp or Cyprinus genus to
which it belongs, by the upper jaw being advanced far beyond the

PLATE XXIX.

lower one, and in having the four beards appendant, from which the appropriate name of *Barbus* or *Barbel* is derived. This fish during the summer prefers the rapid currents and shallows of rivers, and retires at the approach of winter to the more still and deeper places. They live in societies; lurking in holes along the sides of the water under the shelter of the steepest banks, and feed on smaller fish and worms, and flesh of all kinds, for which they dig in the banks like swine. In the day time, they love to lurk occasionally among weeds and between the stones in retired parts of the river, and wander out in the night in search of prey. They spawn in April, and begin to be in season in May and June.

The flesh of the *Barbel* was never in great esteem for the table. Mr. Pennant quotes a passage in *Ausonius*, which, as he observes, is no panegyric on its excellence; and he adds, himself, that "they are the worst and coarsest of fresh-water fish, and seldom eat but by the poorer sort of people, who sometimes boil them with a bit of bacon to give them a relish."

"The *Barbel*," says old Walton, "though he be of a fine shape, and looks big, yet he is not accounted the best fish to eat, neither for his wholesomeness nor his taste: but the male is reputed much better than the female, whose spawn is very hurtful."

Again, when speaking of *Rondeletius*, he makes this remark on the spawn, "we agree with him, that the spawn of the *Barbel*, if it be not poison, as he says, yet that it is dangerous meat, and especially in the month of May; which is so certain, that Gesner and *Gassius* declare, it had an ill effect upon them, even to the endangering of their lives." Sir J. Hawkins, in his annotations on

PLATE XXIX.

Walton, says, "Though the spawn of the Barbel is known to be of a poisonous nature, yet it is often taken by the country-people medicinally; who find it at once a most powerful emetic and cathartic. And, notwithstanding what is said of the wholesomeness of the flesh, with some constitutions, it produces the same effect as the spawn. About the month of September, in the year 1754, a servant of mine who had eaten part of a Barbel, though, as I cautioned him, he abstained from the spawn, was seized with such a violent purging and vomiting, as had like to have cost him his life." According to Mr. Pennant, also, the roe is very noxious, affecting those who unwarily eat of it with a nausea, vomiting, purging, and a slight swelling; and many similar remarks might be adduced, were it necessary, to prove from the most prevalent opinion, among writers, either ancient or modern, that the flesh of the Barbel is indifferent; and the roe, at least, in certain seasons of the year, is poisonous or unwholesome. Mr. Bloch, however, (and, as he says, from experience) fully contradicts this prejudice, as he terms it, against the Barbel: the flesh, he observes, is white and of a good flavour; and of the eggs he has eaten, with all his family, and not a single person among them has ever been incommoded.

Having taken occasion to advert to the "Complete Angler," of that experienced fisherman, old Walton, and the notes of Sir J. Hawkins, it may not be thought amiss by some readers, for us to add one or two little extracts from their directions how to fish for Barbel, as they have the countenance of those who are fond of the amusement of angling, and are, we are persuaded, superior to any thing we could offer on that subject.

PLATE XXIX.

“ The Barbel,” says Walton, “ affords an angler choice sport, being a lusty and cunning fish ; so lusty and cunning as to endanger the breaking of the angler’s line, by running his head forcibly towards any covert, or hole, or bank, and then striking at the line, to break it off with his tail, as it is observed by Plutarch, in his book *De industriâ Animalium* ; and also so cunning to nibble and suck off your worm close to the hook, and yet avoid letting the hook come into his mouth.

“ The Barbel is also curious for his baits, that is to say, that they be clean and sweet, and have your worms well scoured, and not kept in sour and musty moss, for he is a curious feeder ; but at a well-scoured lob-worm he will bite as boldly as at any bait, and especially, if a night or two before you fish for him, you shall bait the places where you intend to fish for him, with big worms cut into pieces* ; and note, that none did ever over-bait the place, nor fish too early or too late for a Barbel. And the Barbel will bite also at gentles, which not being too much scoured, but green, are a choice bait for him, and so is cheese, which is not to be too hard, but kept a day or two in a wet linen cloth to make it tough : with this you may also bait the water, a day or two before you fish for the Barbel, and be much the likelier to catch store : and if the cheese were laid in clarified honey a short time before, as namely, an hour or two, you are still the likelier to catch fish : some have directed to cut the cheese into thin pieces and toast it, and then tie it on the hook with fine silk : and some advise to fish for the Barbel with sheep’s tallow and soft cheese, beaten or worked into a paste, and that it is choicely good

* Instead of these graves, which are the sediment of tallow melted for making candles, cut into small pieces, is mentioned by sir J. Hawkins as an excellent ground-bait for Barbel, Gudgeons, and many other fish, if thrown in the night, before you angle.

PLATE XXIX.

in August, and I believe it: but doubtless the lob-worm well scoured, and the gentle not too much scoured, and cheese ordered as I have directed, are baits enough, and, I think, will serve in any month; though I shall commend any angler that tries conclusions, and is industrious to improve the art."

"Fishing for Barbel," says one of his annotators, on the contrary, "is at best but a dull recreation. They are a sullen fish, and bite but slowly. The angler drops in his bait, the bullet at the bottom of the line fixes it to one spot of the river. Tired with waiting for a bite, he generally lays down his rod, and exercising the patience of a setting-dog waits till he sees the top of the rod move; then begins a struggle between him and the fish, which he calls his sport; and that being over, he lands his prize, fresh baits his hook, and lays in for another.

"The young brood of wasps, hornets, and humble bees are reputed good baits for this fish."

A slight description of this common fish may be sufficient. It sometimes grows to the length of two or three feet in our waters; and in the Danube, were formerly, if they are not at present, taken frequently of a much larger size. After a dreadful carnage between the Turks and Austrians, on the banks of the before-mentioned river, Barbels were found in it of such a vast size, and in such numbers as to become a matter of record; and their propensity for human flesh being well known, the circumstance was attributed to the heaps of dead bodies that had been thrown into the water. The form of this fish is not inelegant; the colours vary at different periods of growth, being sometimes whitish or silvery, and olive on the back, and at others yellowish more or less tinged with a golden hue. The second

PLATE XXIX.

or largest spine of the dorsal fin is serrated in a very remarkable manner; beside this the fin in our specimen contains eleven rays: the pectoral fin thirteen rays: ventral eleven: anal nine; and the tail twenty-two.

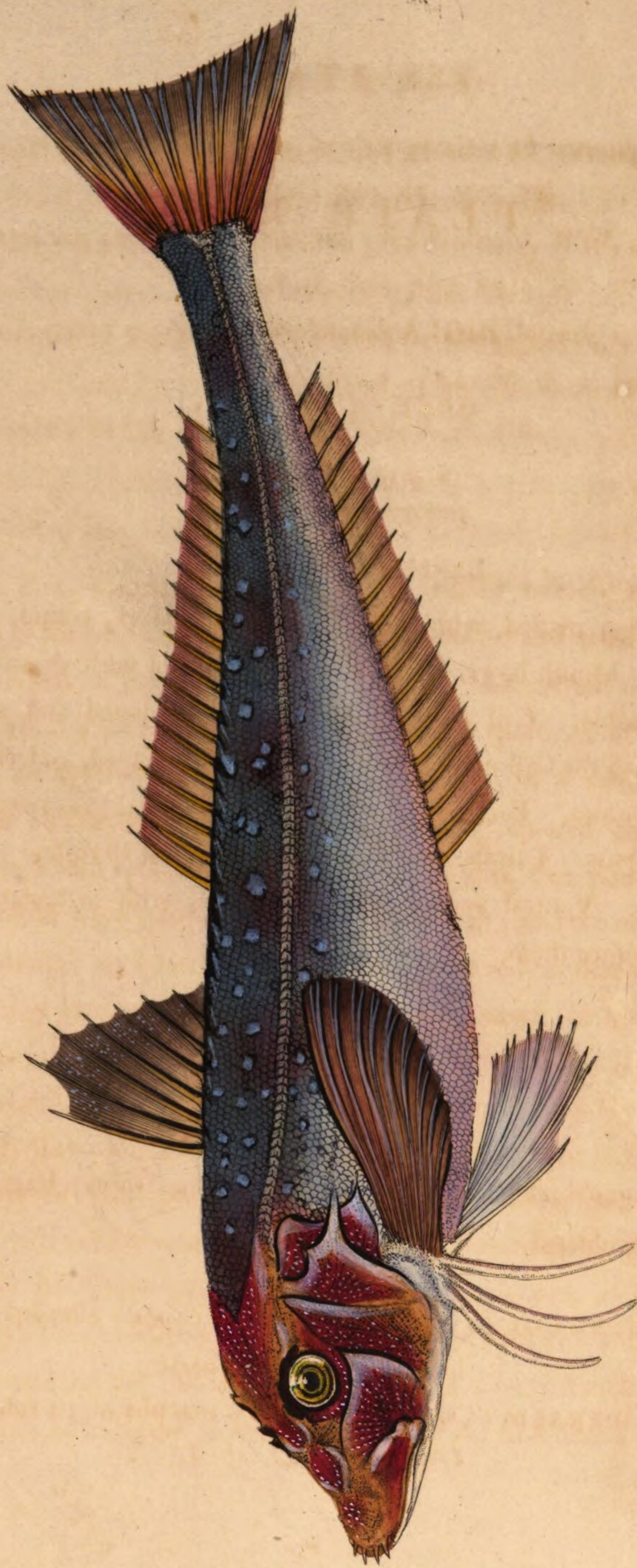


PLATE XXX.

TRIGLA GURNARDUS.

GREY GURNARD.

* THORACICI.

GENERIC CHARACTER.

Head large, mailed, with rough lines. Eyes large, round, placed vertically. Mouth large. Palate and jaws armed with sharp teeth. Nostrils double. Gill cover, a single piece, radiated and spined. Seven rays in the Gill membrane. Body wedge-shaped, and covered with small scales. Back straight, with a longitudinal groove serrated on the margins. Lateral line nearer the back, and straight. Abdomen thick. Ventral and pectoral fins large, with articulated appendages before them.

SPECIFIC CHARACTER

AND

SYNONYMS.

Appendages three; back cinereous with white spots: lateral line broad and aculeated.

TRIGLA GURNARDUS: digitis ternis, dorso cinereo albo-maculato, linea lateralis lata aculeato.

TRIGLA GURNARDUS: digitis ternis, dorso maculis nigris rubrisque.

Gmel. p. 1342. sp. 3.

PLATE XXX.

Trigla varia, rostro diacantho, aculeis geminis ad utrumque oculum.

Artedi gen. 46. *syn.* 74.

Gurnatus seu gurnadus griseus, the grey Gurnard, *Will. Ichth.* 279.

—*Raii, Syn. pisc.* 88.

Trigla lateribus nigro alboque punctatis, linea laterali lata aculeato.

Bloch Fisch. Deutsch. 2. p. 121.

GREY GURNARD, *Penn. Brit. Zool.* 3. p. 276.

The Grey Gurnard is usually from ten, or twelve, to eighteen inches in length, and according to Mr. Pennant and others, is sometimes taken of nearly double that size. The colour of the back varies from a pale to a deeper ash, and the spottings of black and white, or yellowish, seem liable to variation in a similar degree. Gmelin characterizes it specifically as being spotted on the back with black and red, to which M. Bloch objects, that none of those he has seen were spotted with the latter colour; and we must confess that although we have seen them tinged with red on that part, it was not in any instance disposed in spots so as to merit the epithet, *dorso maculis nigris rubrisque*. The lateral line in this species is marked by larger scales, and is more strongly serrated than in the other Gurnards, as Bloch observes; and in the opinion of that naturalist is a distinctive character of the species. The nose is bifurcated, and each side armed with smaller spines, a circumstance remarked by Artedi, but being by no means peculiar to this kind, ought not, as that writer imagined, be considered as a character of the species; and the same may be said of the two spines near the eyes which Artedi mentions. It is rather of a slender shape: the bones of the first dorsal fin strong,

PLATE XXX.

and seven in number : in the second dorsal fin are nineteen rays : in the ventral, six : pectoral, eleven : anal, twenty : and tail, fourteen.

This, like the rest of the Gurnards, feed on crabs, testaceous animals, and the fry of fish. Its flesh is excellent. The Grey Gurnard is taken with the others in nets ; but will eagerly take bait : it is said that they are either so voracious, or so wanton, that they will even bite at a piece of red cloth put into the water, and suffer themselves to be taken rather than lose their hold. It is found in most of the northern parts of Europe.

PLATE XXX.

and seven in number: in the second column the first three are in
the ventral, six: pectoral, eleven: anal, twenty: and tail, fourteen.
This, like the rest of the Gobiidae, feeds on crust. Insects
animals, and the fly of fish. Its flesh is excellent. The Goby
Gobioides is taken with the others in nets, but will eagerly take bait:
it is said that they are either so voracious or so wary, that they will
even bite at a piece of red cloth put into the water, and suffer them-
selves to be taken rather than lose their hold. It is found in most of
the northern parts of Europe.





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PLATE XXXI.

EXOCOETUS VOLITANS.

COMMON FLYING FISH.

* ABDOMINALES.

GENERIC CHARACTER.

Head scaly: mouth without teeth: jaws connected at each side: in the gill-membrane ten rays: body whitish: abdomen angulated: pectoral fins large, and formed for flying: anterior part of the rays carinated.

SPECIFIC CHARACTER

AND

SYNONYMS.

Belly carinated on each side.

EXOCOETUS VOLITANS: abdomen utrinque carinato. *Amoen. ac.*

1. p. 321. *Art. gen.* 8. *syn.* 18. *sp.* 35.

WINGED FLYING FISH. *Penn. Brit. Zool.* 3. p. 333. *sp.* 159.

An interesting creature, introduced into the present work on the authority of Mr. Pennant, who in his turn observes, that he can produce but a single instance of its being taken on the British coasts;

PLATE XXXI.

in June, 1765, one was caught at a small distance below Carmarthen, in the river Towey, being brought up by the tide which flows as far as the town. It was seen by John Strange, Esq. at Carmarthen, and an account of it communicated to Mr. Pennant.

The vastly disproportionate size of the pectoral fins in this genus of fishes, compared with others, affords them an extraordinary advantage in effecting their escape from the larger and more voracious kinds when closely pursued in the water, but this advantage exposes them to a far greater number of enemies, and they not unfrequently escape danger in their native element to become the prey of Gulls, of Corvorants, and other aquatic birds that hover over the surface of the water to catch them in their aërial flights. It can only remain for a short time suspended in the air, for the instant its fins become dry, it must again dip into the water to moisten them. They often quit the water in shoals, and sometimes alight on board of ships in immense numbers in warm climates.

Of this genus, two species are known, beside the present, *E. Volitans*: the latter may be easily distinguished by having each side of the belly carinated, and the ventral fins placed much nearer to the head than in either of the others. It inhabits the Red and American seas, and also those in the warmer parts of Europe; especially the Mediterranean, where it is very common.

Our specimen is somewhat larger than the figure represents. In the dorsal fin are fifteen rays: pectoral sixteen: ventral eight: anal fifteen; and in the tail, twenty.

THE STATE OF NEW YORK

In SENATE, January 15, 1884.

REPORT OF THE COMMISSIONERS OF THE LAND OFFICE

IN RESPONSE TO A RESOLUTION PASSED BY THE SENATE

APRIL 18, 1883.

ALBANY: J. B. LIPPINCOTT & CO. PRINTERS.

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PLATE XXXII.

GASTEROSTEUS PUNGITIUS.

LESSER OR TEN SPINED STICKLEBACK.

* THORACICI.

GENERIC CHARACTER.

Head oblong, smooth; jaws armed with small teeth: tongue short, and obtuse: palate smooth. eyes moderate, very little prominent and lateral. Branchiostegeous membrane with three, six, and sometimes seven rays; operculum of two pieces, rounded and striated. Body carinated on each side and covered with bony plates: distinct spines before the dorsal fin: lateral line straight: ventral behind the pectoral fins, but above the sternum.

SPECIFIC CHARACTER

AND

SYNONYMS.

Dorsal spines about ten; and the sides destitute of plates.

GASTEROSTEUS PUNGITIUS: spinis dorsalibus sub-decim, lateribus absque scutis.

GASTEROSTEUS PUNGITIUS: spinis dorsalibus decem. *Fn. Suec.*

337.—*Gmel. Syst. Nat.* 1326. *sp.* 8.

Centriscus spinis decem vel undecim non perpendiculariter erectis,
&c. *Klein. pisc. miss.* 4. *p.* 48. *n.* 4.

PLATE XXXII.

Pungitius alterum genus. *Aldro. pisc. p. 628.*

Spinarella Pusillus. *Bell. La petite épinoche de mer. Bloch.*

LESSER STICKLEBACK. *Willughby Ichth. p. 342.*

Ten spined Stickleback. *Penn. Brit. Zool. 3. p. 219. n. 2.*

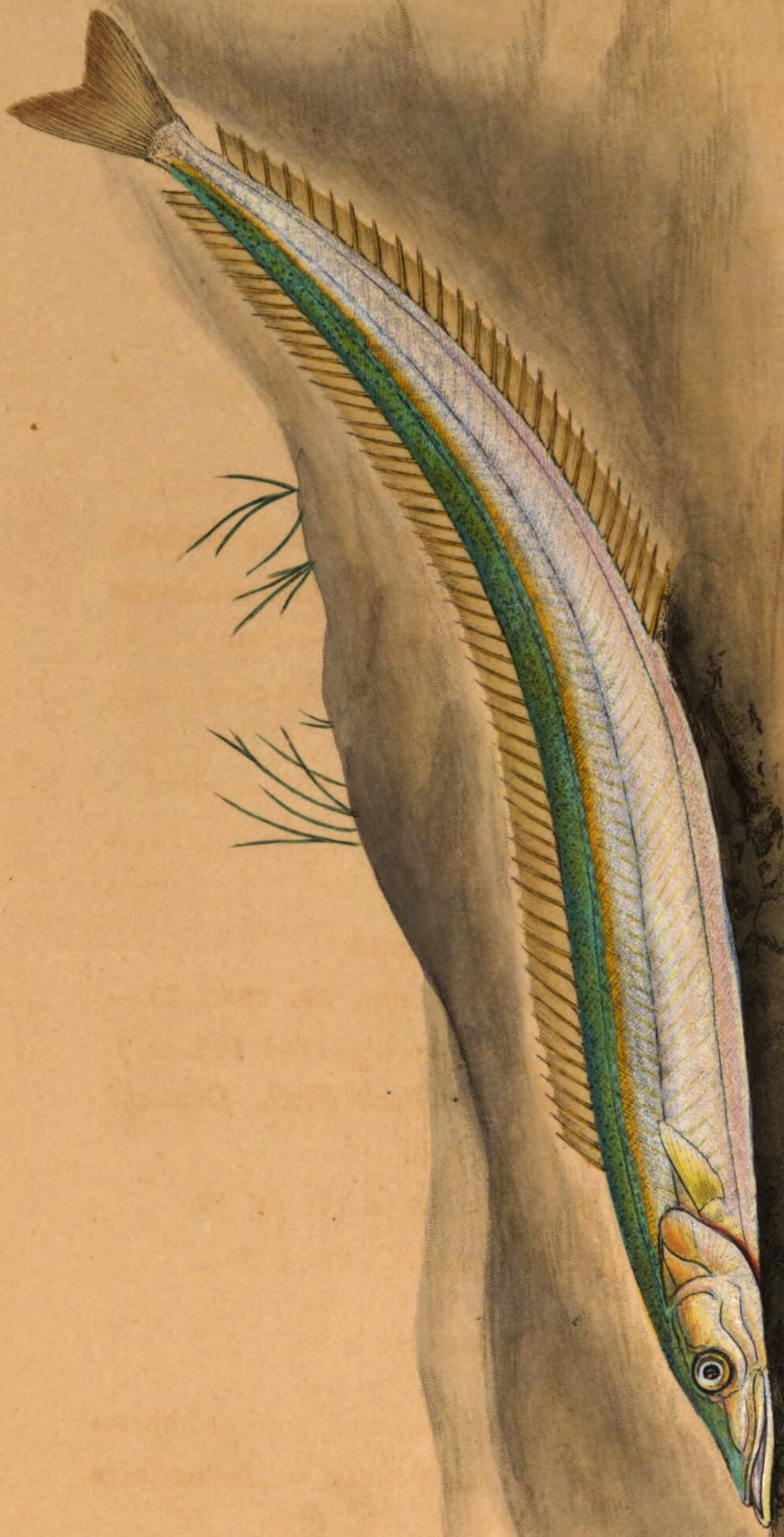
The lesser Stickleback is allowed to be the most diminutive of the fish tribe known: very rarely exceeding, when full grown, an inch and a half in length, and is even seldom found of that size. Some specimens in our possession we should however add, that were taken in the open sea, are full as large as the *G. Aculeatus*, or three spined Stickleback found in our fresh waters: the colours were remarkably clear, greenish on the back, and silvery on the belly and sides, but in other particulars they agree with such as we have found occasionally of a smaller size in little creeks on the sea shore.

This species is of a rather more slender shape than the common kind, and the jaws a little longer in proportion: colour on the back, olive: sides, yellowish, and beneath silvery. The number of the dorsal spines Linnæus and Gmelin admit as the principal distinction of the several species in this genus: so far as relates to the kind before us, we may venture to say the number of them is not always the same. We have them with ten spines, as those authors describe it; we have it also with nine; and one specimen with only eight. This has induced us to make a small, and it is conceived an allowable addition, to the specific character given by those authors. They resemble in a general manner the common kind as before remarked, but are destitute of those remarkable plates on the sides so conspi-

PLATE XXXII.

cuous in the others, and this is, in our opinion, a strong and unerring particular, by which this kind may be distinguished.

In the dorsal fin of one specimen we found ten rays, and in the pectoral fin the same number : in the anal fin nine rays ; and twelve in the tail.



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PLATE XXXIII.

AMMODYTES TOBIANUS.

SAND-LAUNCE, OR SAND-EEL.

* APODES.

GENERIC CHARACTER.

Head compressed, narrower than the body; upper lip doubled, lower jaw narrow and pointed: teeth sharp pointed. Gill membrane of seven rays: body long, square. Tail fin distinct.

SPECIFIC CHARACTER

AND

SYNONYMS.

SAND-LAUNCE, inferior jaw pointed.

AMMODYTES TOBIANUS. *Art. gen.* 16. *syn.* 29. *spec.* 35.—

Fn. Suec. 302.—*Gmel.* p. 1144. 147. *sp.* 1.

Ammodytes maxilla inferiore acuminata. *Bloch Fisch. Deutschl.*

3. p. 24. t. 75. f. 2.

Sandels or Launce. *Ray pisc.* p. 38. n. 165. t. 11. fig. 12.

Sand-Launce. *Penn. Brit. Zool.* 3. p. 156. n. 65. t. 25.

The common Sand-Launce is the only species of its genus hitherto discovered. It inhabits most of the sandy shores in the northern

PLATE XXXIII.

parts of Europe ; and is considered as a fish of excellent flavour ; yet it is seldom taken, except for baiting the hooks by the fishermen, to catch other fish.

At the ebb of the sea it buries itself at about the depth of a foot in the sand, and there remains concealed till the returning tide : sometimes at low water its nose may be just perceived above the surface of the sand, and in general its lurking place may be discovered by a little dimple or bubbling in the sand.

These fish grow to the length of ten or twelve inches : on our coasts they are more frequently observed about two or three inches less. They feed on worms, and are the prey of the Porpesse, and other voracious creatures : in the month of May they deposit their spawn in the sands.

In the dorsal fin of one specimen in our possession are fifty-four rays : in the pectoral fin fifteen : anal twenty-eight ; and caudal sixteen.



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PLATE XXXIV.

BLENNIUS VIVIPARUS.

VIVIPARUS BLENNY.

*JUGULARES.

GENERIC CHARACTER.

Head sloping: six rays in the gill-membrane: body lanceolate:
ventral fins of two united rays: anal fin distinct.

SPECIFIC CHARACTER

AND

SYNONYMS.

Mouth with two tentacula: dorsal, anal and caudal fins united.

BLENNIUS VIVIPARUS: ore tentaculis duobus.

BLENNIUS VIVIPARUS: ore tentaculis duobus. *Linn. Fn. Suec.*

317.—*Gmel. p. 1182. sp. 11.*

Enchelyopus corpore lituris variegato pinna dorsi ad caudam sinuata.

Gron. mus. 1. 65. n. 145.

*Blennius capite dorsoque fusco-flavescente lituris nigris, pinna ani
flava. Art. syn. 45.*

*Blennius naribus tubulosis, Bloch Fisch. Deutschl. 2. p. 188. n. 3.
t. 72.*

MUSTELLA VIVIPARA. *Will. ichth. p. 122. Raii. pisc. p. 69.*

VIVIPAROUS BLENNY. *Penn. Brit. Zool. 3. p. 172. n. 5. t. 10.*

PLATE XXXIV.

The Viviparous Blenny is a most prolific creature, producing according to some naturalists from two to three or four hundred young at a time. It grows to the length of twelve or fifteen inches, and feeds on worms, crabs, and small fish. The flesh is coarse, and scarcely eatable.

Whether they are common, except in the mouth of the river Esk, at Whitby, Yorkshire (as Mr. Pennant acquaints us) we are not informed. It appears to us to be a rare, or at least a local kind, and it was not without some trouble we procured a specimen of it for the present work.

In the dorsal fin are 92 rays: pectoral 48: ventral 2: anal 68: and in the tail 48.



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PLATE XXXV.

COTTUS SCORPIUS.

FATHER LASHER, or SEA SCORPION.

*THORACICI.

GENERIC CHARACTER.

Head broader than the body, and spinous: eyes vertical, and furnished with a nictitant membrane: six rays in the gill membrane: body round, without scales, and tapering towards the tail: one or more dorsal fin.

SPECIFIC CHARACTER

AND

SYNONYMS.

Head armed with many spines: upper jaw rather longer than the under one.

COTTUS SCORPIUS: capite spinis pluribus, maxilla superiore paulo longiore. *Linn. Fn. Suec.* 323.

Cottus alepidotus, capite polyacantho, maxilla superiore paulo longiore. *Mus. Ad. Fr. I. p.* 70.

LA SCORPENE *Belon*, 242.

Scorpænæ *Belonii* similis *Cornub.* Father-lasher. *Will. ichth.* 133.

—*Raii syn. pisc.* 145.

SEA SCORPION *Edw. glean. t.* 284.

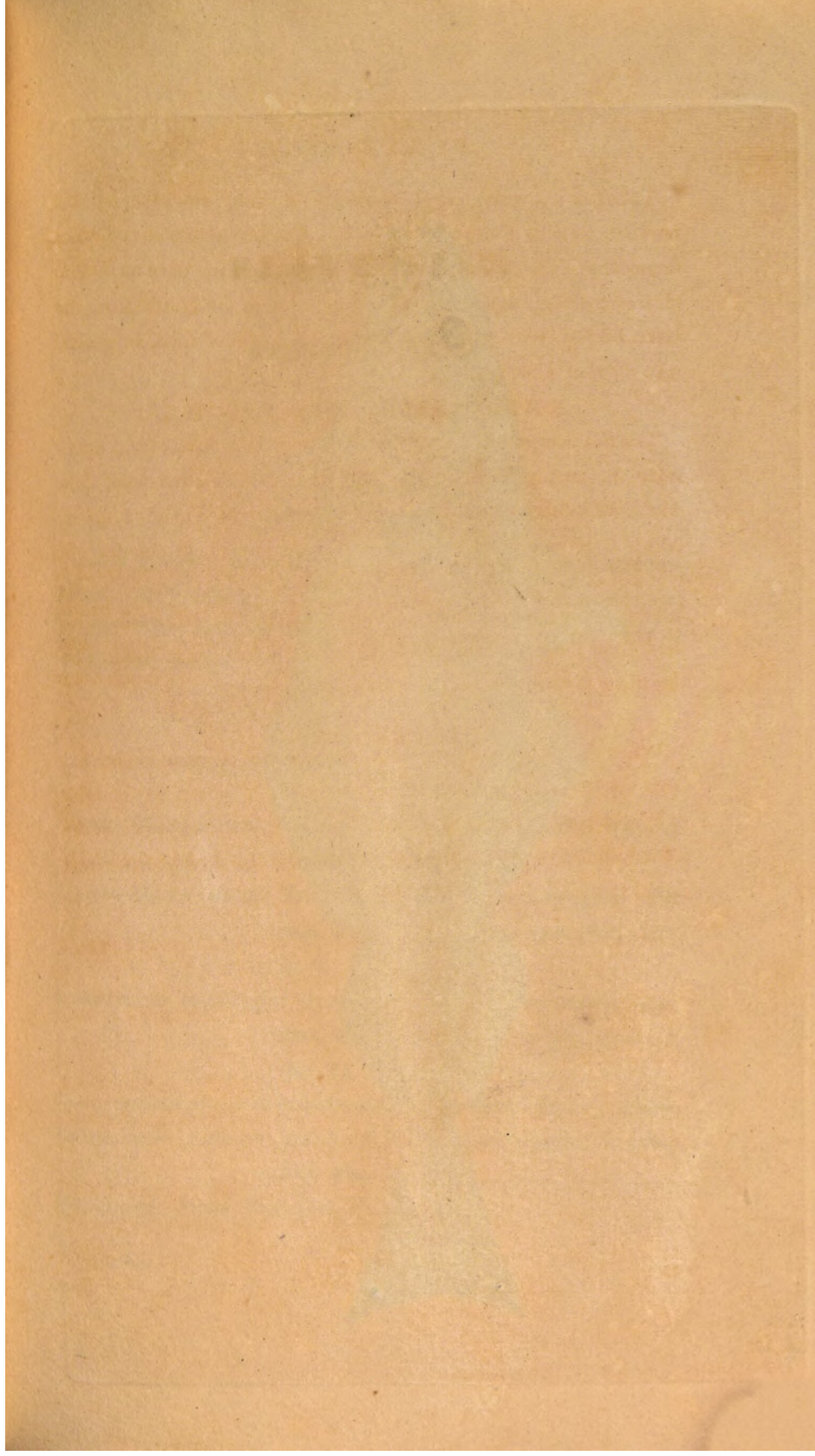
FATHER-LASHER. *Penn. Brit. Zool.* 3. p. 213. sp. 99.

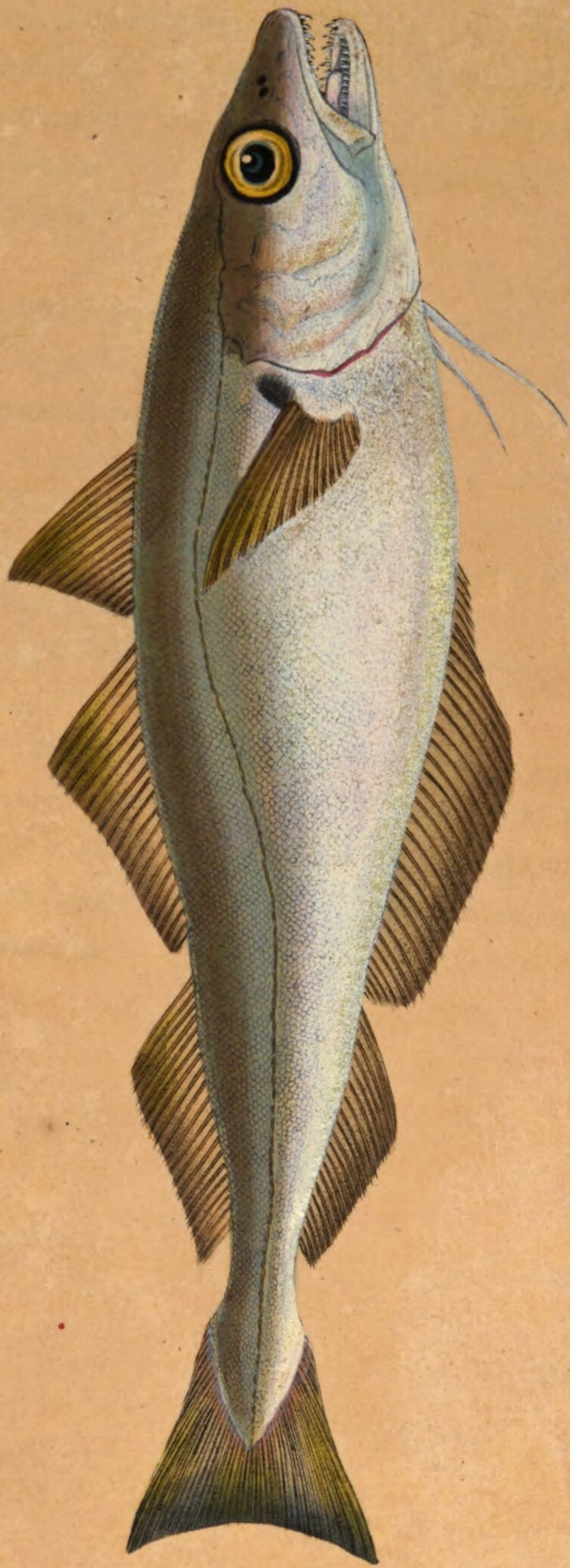
PLATE XXXV.

This fish is a very general inhabitant of rocky shores in all the northern parts of Europe and Siberia. On our coasts it is seldom found above six or eight inches in length, but we have seen them rather exceeding the length of a foot; and in the North Seas, the Greenlanders, with whom it is a principal article of food, in general take them of a far greater size.

The Sea Scorpion is a very variable fish in its colours, lurks under stones or among the sea weeds, and feeds on crabs and small fish. The head is furnished with many strong and sharply pointed spines, which it is capable of exerting in a very formidable manner. It will follow Sharks and other voracious fish with the greatest temerity, lashing and wounding them with these spines, and effectually drive them from those places where it is accustomed to haunt itself. To the Blenny, as before said, it is a desperate enemy.

When the mouth is closed the upper jaw projects considerably beyond the lower one, but this latter it is capable of advancing in order to take its prey. In the first dorsal fin are eight strong rays: in the second fourteen: pectoral nine: ventral three: anal eleven: and caudal fourteen.





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PLATE XXXVI.

GADUS MERLANGUS.

WHITING.

JUGULARES.

GENERIC CHARACTER.

Head smooth. Seven slender rays in the branchiostegous membrane. Body oblong. Scales deciduous. All the fins covered with a skin. More than one dorsal and anal fin; rays unarmed. Ventral fin slender, pointed.

SPECIFIC CHARACTER.

White; back brownish: upper jaw longest.

GADUS MERLANGUS: albus, dorso subfusco, maxilla superiore longiore.

GADUS MERLANGUS. G. albus, maxilla superiore longiore. *Fn. Suec.* 310.—*Gmel. Linn. Syst. Nat.* 1167. sp. 8.

Gadus dorso tripterygio, ore imberbi, corpore albo, maxilla superiore longiore. *Art. gen.* 19. *syn.* 34. *spec.* 62.

Gadus corpore albo, ore imberbi, maxilla superiore longiore. *Bloch. Asellus mollis. Jongst. pis.* 1. 2. f. 3.—*Asellus major* L. albus. *Raj. pisc.* 55. n. 8.

WHITING. *Penn. Brit. Zool. V.* 3. sp. 80.

PLATE XXXVI.

To the history of the common Whiting we can add nothing that is not already known. The Whiting is a fish sufficiently abundant in all the temperate parts of Europe. We are told it is found in the Baltic, Mediterranean, and Northern Seas; although less frequent in those, than in the seas which wash the shores of Holland, France, and England, where at most seasons of the year it is found in the greatest plenty. One circumstance should be observed, the principal fisheries for the Whiting commence upon the French coasts as early as January or February; but on the coasts of Holland and those of our own country the Whiting fisheries do not take place much before April or May.

During the summer months the Whiting haunts our coasts in vast shoals, hovering at the distance of one, two, or three miles from the land. As they feed on the young of other fishes, especially Sprats and Herrings, the hooks with which they are taken are commonly baited by the fishermen with pieces of these fishes: they are also very fond of crabs and marine worms.

The Whiting spawns in the beginning of the winter; the young fry make their appearance shortly after: these increase rapidly in size, till they become ten or twelve inches in length, after which their growth is observed to be much slower. Pennant, and after him, Bloch and other writers, speak of Whiting weighing from four to eight pounds each, that have been taken in the deep water at the edge of the Doggerbank. This is not very improbable, although we may naturally conclude, they are not commonly taken there of that enormous magnitude; it is well known that the largest Whittings brought to our markets, are caught in that part of the Dutch sea, in which the Doggerbank lies. There are likewise considerable fisheries upon our

PLATE XXXVI.

western coasts. Upon the back of this species are three fins, the first containing in the specimen we have figured, fifteen rays, the second twenty, the third twenty-one. In the pectoral fin are seventeen rays; the ventral one has six. There are likewise two anal fins, in the first of which we find thirty-two rays; and in the second, twenty. Those in the tail amount to thirty-three.

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PLATE XXXVII.

SPARUS RAI.

RAY'S TOOTHED GILT-HEAD,

THORACICI,

GENERIC CHARACTER.

Teeth strong ; grinders rather obtuse and crowded ; lips doubled. Five rays in the gill-membrane, the cover scaly. Body compressed ; lateral line curved on the posterior part ; pectoral fins rounded.

SPECIFIC CHARACTER

AND

SYNONYMS.

Blueish-silvery : fins covered with scales : two teeth larger than the rest in the lower jaw.

SPARUS RAI: subargenteo-cærulescens, pinnis squamatis ; maxilla inferiore longiore dentibus duobus majoribus.

SPARUS RAI. S. pinnis squamatis. *Bloch.*

Brama marina cauda forcipata. *D. Jonston. Raii syn. pisc. 115.*

TOOTHED GILT-HEAD. *Penn. Brit. Zool. n. 114.*

La Castagnole. *Duhamel Trait de Pêch. T. 3. p. 26. pl. 5. f. 1.*

Brême dentée. S. Brama. S. pinnâ caudali

PLATE XXXVII.

forcipatâ pinnarum dorsi et ani radiis septem
prioribus elongatis. *Bonaterre Encyc.*
Ichth. p. 104. n. 36. pl. 50. fig. 192.

The toothed Gilt-head is to be considered as the rarest of the fish tribe hitherto discovered on the British coasts, with the exception of two or three very doubtful species mentioned by Pennant, after Ray and Willughby. A fish of this kind (the toothed Gilt-head) was communicated to Mr. Ray by Mr. Jonston, a gentleman of Yorkshire, who informed him it was found at the mouth of the Tees, on the 18th of September, 1681; and a figure of it was in consequence given in Willughby's work, where it appears under the following designation, *Brama marina cauda forcipata*. To this account and figure Mr. Pennant refers; whether he ever saw the fish itself is uncertain: for he does not speak of it as a native of our seas, upon any other authority than that of Ray above quoted.

Since the time of Ray there is no instance within our knowledge on record, to prove that the toothed Gilt-head has been taken, or seen upon our coasts till the year 1792, when a fish of this species was caught at St. Andrew's, Scotland, and presented by James Lumsdaine, Esq. of Innergellie, to the late Mr. Weeks, Proprietor of the Edinburgh Museum, who caused it to be finely preserved, and exhibited. After the dissolution of the Museum the subject came into our possession, and thus enabled us to submit a figure of this extraordinary creature to our readers, the drawing of Plate 37, being taken from it.

PLATE XXXVII.

We have reason to believe that our specimen is the only one of the species that has been found on the British coasts since the year 1681 ; and if we may be allowed to judge from the figures given by Ray, is far more complete than his was at the time his drawing was taken. The execution of his figure, however bad, is certainly excusable, when we consider the state of the imitative arts in this country at those days in which he lived ; but there are several misrepresentations in the character of the fish itself that can only be accounted for by supposing the specimen in his possession had sustained considerable injury. For example, the dorsal and anal fins are divided into a number of smaller fins, or rather tufts in a whimsical manner ; a mistake that seems to have arisen from the mutilated state of the fins, the membranes of which were most likely split in various places, and might suggest to the artist the idea that they were really to be shewn as distinct fins : all the scales with which the fins are imbricated seem to have been rubbed off, and the spinous rays are also wanting. The omission of the lateral line may be an oversight : the teeth perhaps were mutilated, or at least are very carelessly expressed : they appear perfectly setaceous, and at the same time the two teeth which are larger than the rest in the under jaw, are entirely omitted. In Pennant's figure, which seems to be an improvement upon that of Ray, the divided portions of the dorsal and anal fins are connected in a proper manner, they are slightly imbricated with scales, and the canine teeth are represented, but still the lateral line is wanting.

This species has been captured on the coast of France as well as England ; in the former it is observed to be scarcely more frequent than with us. Duhamel, in his history of fishes, delineates it, as does also Bonaterre, but the drawing of the latter is confessedly a copy from Pennant's. The figure of Duhamel is defective, wanting

PLATE XXXVII.

the scales upon the fins. Bloch has given an incomplete representation of it also, his specimen not having the two canine teeth in the inferior jaw; a circumstance which this author does not pass over in silence. He animadverts upon Pennant, for having represented two such teeth, observing that they were not found either in his own fish, in the figure of Ray, nor in that given by Duhamel; and hence infers that Pennant is in an error. This remark of Bloch is equally vague, and contradictory, for Duhamel shews them very distinctly as well as Pennant; and it is only evident that they were accidentally wanting in the specimen in Bloch's collection, for in that which we possess they are perfectly distinct.

Neither Linnæus, nor Gmelin after him, speak of this species; perhaps they were unable to ascertain its characters from Ray, and having never seen the fish, did not think proper to hazard any opinion concerning it. Bloch, who mentions this, assigns to it the specific name of *Raii*, in memory of Mr. Ray, who first introduced the species to our observation; a name, we feel it highly proper to retain: the character which Bloch has offered for its specific distinction, with some addition, we have adopted likewise; we agree with him that the imbricated scales on the fins, are a striking character of the species, at the same time that the canine teeth which were not visible in his specimen, are in our mind of too much consequence to remain unobserved.—*Sparus dentex*, *Sparus Cynodon*, &c. are furnished with canine teeth, but in those species they are situated in both jaws, and in other respects they are quite different from the toothed Gilt-head. Duhamel calls our fish La Castagnole, a title, it will be proper to apprise the reader, under which three distinct fishes are known in France; the Castagnole of the Genoese and Sardinians, is another fish likewise.

PLATE XXXVII.

The dorsal fin in our specimen, contains thirty-seven rays; the pectoral fin twenty-four; ventral fin seven; anal fin thirty-one; tail fin twenty-five.

PLATE XXXVII

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fin twenty-five. The pectoral fin is inserted at the base of the head,
and is composed of two rays, the first of which is a long, slender,
and slightly curved ray, and the second is a shorter, stiffer ray,
which is slightly notched at the tip. The anal fin is inserted
at the base of the dorsal fin, and is composed of two rays, the
first of which is a long, slender, and slightly curved ray, and the
second is a shorter, stiffer ray, which is slightly notched at the
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PLATE XXXVIII.

GOBIUS MINUTUS.

SPOTTED GOBY.

THORACICI.

GENERIC CHARACTER.

Head small. Eyes placed nearly together, with two pores between them. Gill-membrane, with four rays. Body small, compressed both sides, covered with small scales, behind the vent a tubercle. Ventral fins united into the form of a funnel. Dorsal fins two.

SPECIFIC CHARACTER

AND

SYNONYMS.

Whitish, spotted with ferruginous ; rays of the dorsal, and caudal fin obscurely streaked with the latter colour.

GOBIUS MINUTUS: albicans ferrugineo-maculatus, radiis dorsalibus, et caudalibus ferrugineo obsolete striatis.

Pall. spic. Zool. 8. p. 4. Gmel. Linn.

Syst. Nat. p. 1199. sp. 13.

Gobius Minutus. G. albidus, ferrugineo maculatus, oculis cæruleis.

Shaw. Zool. V. 4. n. 2. p. 36.

SPOTTED GOBY. *Penn. Brit. Zool. V. 3. sp.*

PLATE XXXVIII.

Mr. Pennant acquaints us, that he saw several of this species taken on our sandy coasts, in the summer of the year 1775, in the shrimp nets : he does not certainly mean by this to say, that they frequent the sandy shores of our island during the summer months only, as some have imagined; or if he does, the idea is unfounded. We have received them from various parts of the sea coasts in all seasons of the year, where they seem to be not less common during the winter, than the summer months. In the wide sweep of sands, called Traeth Levan, that extends along the south side of Beaumaris bay, opposite the island of Anglesea ; upon the shores of the Severn, and indeed on many other of our sandy coasts, this fish has attracted our remark lurking or swimming with the shrimps, in the shallow pools of water left by the sea at ebb-tide. The same species also is not unfrequently taken with the shoals of sprats captured at a little distance from the shore.

The spotted Goby is a pretty, delicate little creature, whose usual length very rarely exceeds two inches, or two inches and a half; three inches or rather better is the length of that from whence our figure is taken, but that is of an uncommon size. *Pallas*, who describes this species, has defined its character with much precision ; he speaks especially of the obsolete streaks across the rays of the dorsal fins, and tail, which are sufficiently distinct, except when the fins happen to be expanded, at which time they indeed appear as unconnected dots : the same may be said also of those across the anal fin, which he does not notice. These dots or streaks, are uniformly constant on all the specimens of the fish that have fallen under our observation, varying a trifle only in their tint of colour.—In the first dorsal fin are six rays, in the second are eleven ; the pectoral fin has twenty, the ventral nineteen, anal eleven, caudal sixteen.

PLATE XXXVIII.

Bloch does not include this species in either of his works on fishes. Pennant considers it as the *Gobius Aphya* of Linnæus, in which particular, later writers are persuaded he is mistaken; it must be confessed, however, that there still remains some little doubt as to the precise difference between the *Aphya* and *Minutus*; Linnæus tells us the former has the body and fins barred with brown, which will in a certain degree apply to the characters of *minutus* likewise. That our fish is the *minutus* of Pallas, will not admit of doubt.

Blotch does not include this species in either of his works on fishes. Pennant considers it as the *Gobius* of Linnaeus, in which particular, later writers are persuaded he is mistaken; it is not the same, however, that there still remains some little doubt as to the precise difference between the *Alpheus* and *Albinus*. I cannot tell as the former has the body and fins barred with brown, which will in a certain degree apply to the character of *Albinus* likewise. That our fish is the *Albinus* of Pallas, will not admit of doubt.

The young, and sometimes in the first and second years of age, are marked with a brownish or reddish line along the side of the body, and a similar line on the head, which is not present in the adult state. The young of this fish are very common in the sea, and are often taken in the nets of the fishermen. They are very voracious, and feed on small crustaceans, mollusks, and other small animals. They are also very active, and are often seen swimming rapidly in the water. The young of this fish are very common in the sea, and are often taken in the nets of the fishermen. They are very voracious, and feed on small crustaceans, mollusks, and other small animals. They are also very active, and are often seen swimming rapidly in the water.

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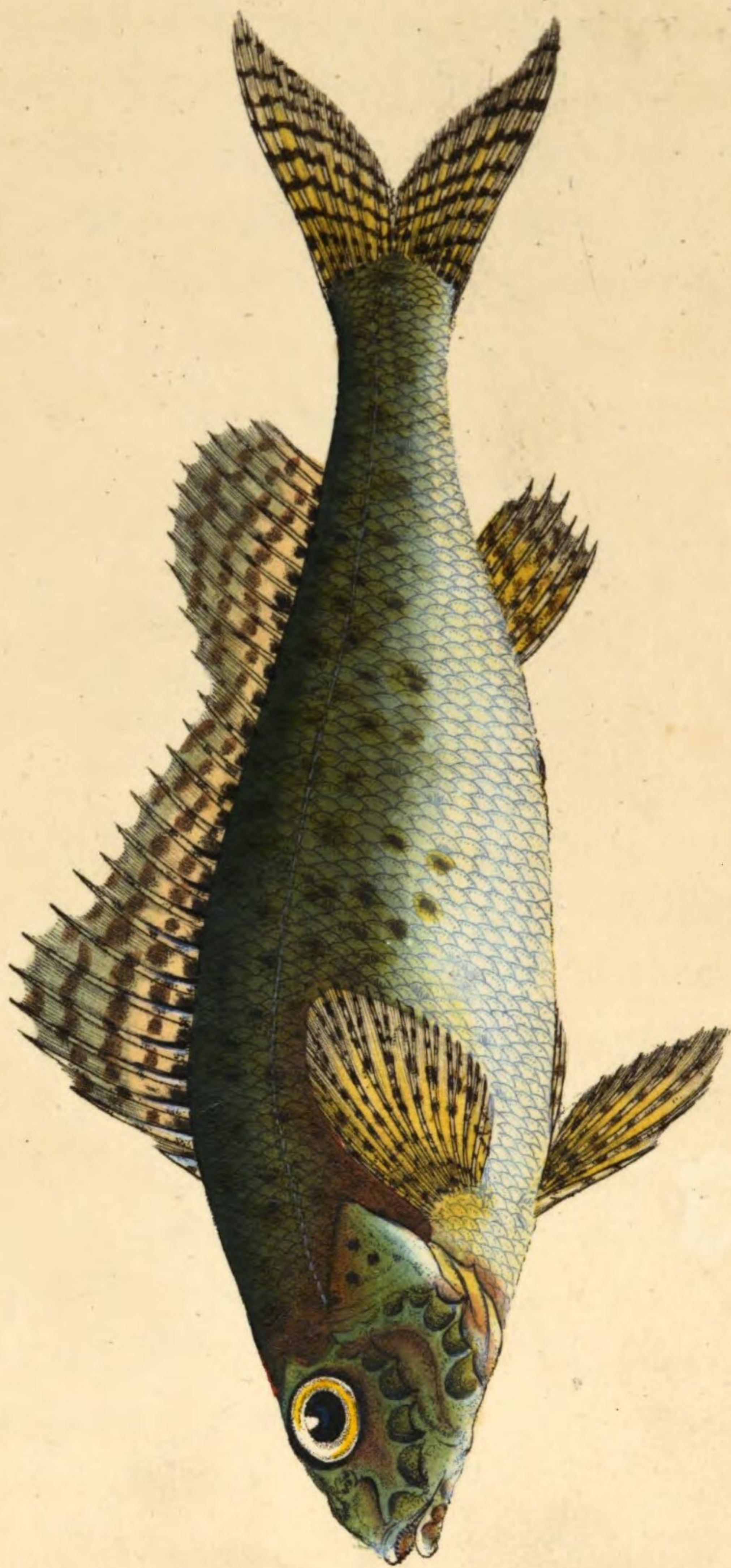


PLATE XXXIX.

PERCA CERNUA.

RUFFE.

THORACICI.

GENERIC CHARACTER.

Jaws unequal. Teeth acute, and incurvated. Gill covers of three plates, scaly; the upper plate serrated. Seven rays in the gill membrane. Lateral line arched with the back, scales hard and rough. Fins spinous.

SPECIFIC CHARACTER.

Dorsal fin with twenty-seven rays; the first fifteen spinous.

PERCA CERNUA: pinnæ dorsalis radiis 27, spinis 15. *Linn. Fn.*

Suec. 335. *Gmel. Linn. Syst. Nat.* 1320.

sp. 30.

RUFFE. *Penn. Brit. Zool. T.* 3. n. 174.

This kind of Perch proves to be a general inhabitant of all the countries in the north of Europe: its haunts are chiefly clear streams, lakes, and rivers, where it delights in the deepest waters; and preferring cold to warm situations, appears to be most abundant in those of mountainous places. Mr. Pennant observes, that it is

PLATE XXXIX.

found in several of the English streams, which may be the fact. So far as we are acquainted with its haunts, and history as a British fish, there is reason to conclude, it is at least local. In the river Virny, which flows through the eastern confines of Merionethshire, and some contiguous streams in Shropshire, we have perceived it to be not very uncommon.

The flesh of this fish, like that of the Common Perch is excellent, particularly in the spring or autumn. The Ruffe is a small creature, seldom attaining above five or six inches in length: the form is slender; and more graceful than the common Perch, at the same time, that in point of beauty, the Ruffe is far beneath the other.

This species feeds on smaller fishes, worms, and aquatic insects, and is in its turn, the food of larger voracious fishes; or of the wild fowl that frequent its haunts. The Ruffe spawns about the month of March: multiplying prodigiously in many of the vast lakes upon the continent of Europe; and assembling in shoals in the deepest parts of the water. The number of rays in the dorsal fin, is the character by which this fish is usually distinguished: in the pectoral fin are thirteen rays; in the ventral one spinous and six soft rays; the anal fin contains seven rays: tail nineteen.



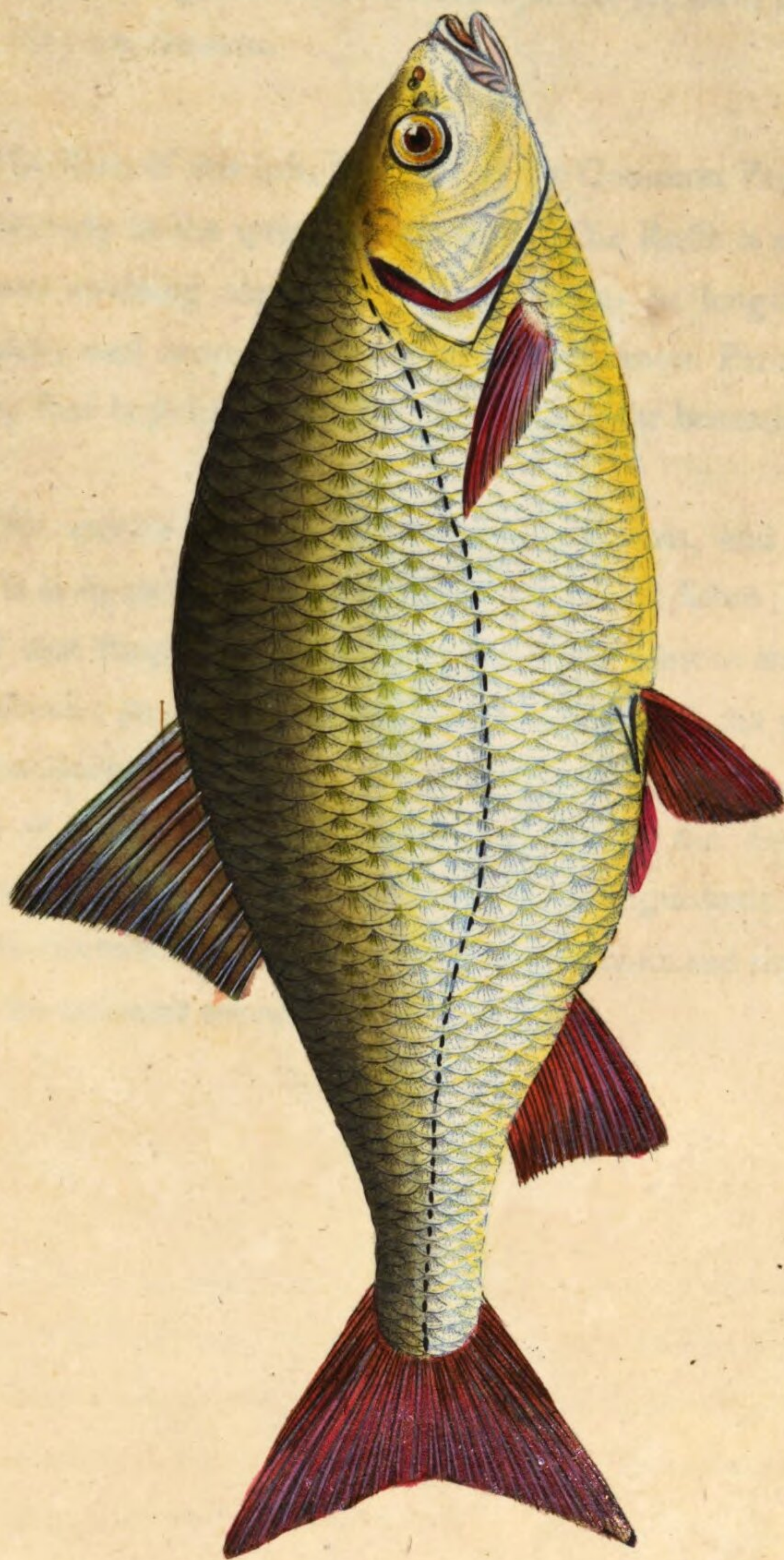


PLATE XL.

CYPRINUS ERYTHROPTALMUS.

RED EYE.

ABDOMINALES.

GENERIC CHARACTER.

Mouth without teeth : gill-membrane with three rays : body smooth,
and whitish in general : ventral fins usually with nine rays.

SPECIFIC CHARACTER

AND

SYNONYMS.

Body deep : iride orange ; ventral, anal fins, and tail red.

CYPRINUS ERYTHROPTALMUS : latus, iride crocea, pinnis
ventralibus anali caudaque cinnabarinis.

CYPRINUS ERYTHROPTALMUS pinna ani radiis 15, pinnis rubris.

Linn. Fn. Suec. 366.—*Gmel. Linn. Syst.*
1429. sp. 19.

This is certainly the Rud of Pennant, (No. 170), which he says is
found in the Charwell, near Oxford ; in the Witham in Lincolnshire,

PLATE XL.

and in the fens in Holderness. The same author conjectures that it may be the *Shallow* of the *Cam*.

Linnæus having described *Cyprinus Orfus* as an inhabitant of our fresh waters, without speaking of the other species, *Erythrophthalmus*, as a British fish, the two kinds have been erroneously confounded together as one species, by some writers in this country. Bloch takes occasion to comment upon the foregoing remark of Linnæus, in his history of fishes, when describing his *Orphe* "Linne," he tells us, "dit que ce poisson se tient dans le Rhin, et dans les rivières de l'Angleterre. Mais je doute qu'on le trouve ni dans l'un, ni dans les autres." Another passage in the same description deserves also notice, "Quand Willugh. demande si notre Orphe est le même poisson que le rud des Anglais, il faut lui répondre négativement; car ce dernier est le rotengle*."

This is a remarkably common fish in many countries of Europe: it is extremely prolific; spawns early in the spring; feeds on aquatic plants, worms, and insects, and seldom grows to the length of more than twelve or fourteen inches: as a British fish, it seems to be most plentiful in the rivers in the north of England, or in Scotland. The back is of a dark colour, blending into greenish till it approaches near the lateral line, below which the sides are bright and silvery, glossed very faintly with yellow; the colour of the iride is remarkable, as is also the brilliant red of the fins, which form a striking contrast to the delicate tints of the belly. The Linnæan specific character, which, beside noticing the colour of the fins, is taken

* Meaning *Cyprinus Erythrophthalmus*.

PLATE XL.

from the number of rays in the anal fin, is not to be depended on; in our specimen, for example, there are only twelve rays instead of fifteen. The dorsal fin has eleven rays; pectoral fin nineteen; caudal twenty.

PLATE XII.

ENTOMOLOGICAL



From the collection of the
British Museum, London

Described by Mr. J. L. G. Rehn,
and illustrated by Mr. J. L. G. Rehn

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PLATE XLI.

TETRODON TRUNCATUS.

TRUNCATED SUN-FISH.

* PISCES BRANCHIOSTEGI.

GENERIC CHARACTER.

Jaws bony, advanced, divided at the tip: aperture of the gills
linear: body beneath muricated: no ventral fins.

SPECIFIC CHARACTER

AND

SYNONYMS.

Unarmed, smooth, compressed, oblong and truncated: tail very small,
and connected with the dorsal and anal fin.

TETRODON TRUNCATUS: inermis lævis, compressus, oblongus
truncatus cauda brevissima pinna dorsali
analique annexa. *Gmel. Linn. Syst. Nat.*
1448. sp. 7.

TETRODON MOLA, truncatus (β)—T. inermis, lævis, compressus,
oblongus, cauda brevissima, pinna dorsali
analique annexa, spiraculis lunatis. *Retzius*
Nov. act. Stockh. 6. 2. p. 116.

PLATE XLI.

Sun-fish from Mount's-Bay. *Borlase Cornwall.* 268. *tab.* 26. *f.* 7.

Oblong Sun-fish. *Penn. Brit. Zool.* V. 3. *p.* 100. *n.* 1.

PLATE XLI.

Dr. Borlase appears to be the first, and almost only English writer, who has seen and described this fish. In his Natural History of Cornwall, he speaks of it under the title of the Sun-fish from Mount's Bay, and mentions one that was taken at Plymouth in 1734, that weighed five hundred pounds. Whether Mr. Pennant ever had an opportunity of inspecting this species is uncertain; the figure given of it in the British Zoology, as well as that of the Short Diodon, *Tetrodon Mola*, is certainly an indifferent copy from the plate of Borlase.

The principal fishery for the short Sun-fish, is carried on upon the Western coasts, those of Cornwall in particular, where the oblong or truncated Sun-fish is sometimes found in company with the other sort. There are instances of the truncated Sun-fish being caught of an enormous size upon that coast. We have once seen the dried skin of this species, the animal of which, when living, weighed between two and three hundred pounds. Our figure is taken from a small specimen, obtained in a recent state, in one of our fishing excursions on the Bristol channel. The dorsal fin in this, contains twelve rays: pectoral fourteen: anal fifteen, and tail seventeen. This fish subsists on worms of the testaceous and other tribes, small crabs, &c. fragments of these being found on dissection in the stomach.

The truncated Sun-fish is described by the judicious Borlase as being altogether distinct from the other kind; and Mr. Pennant is to

PLATE XLI.

be commended for having adhered to the opinion of that writer in the British Zoology. We are only surprised that Gmelin, or any other Naturalist, after inspecting the two kinds, or even attending to the remarks of Borlase, could for a moment believe them to be the same. In the last edition of the Linnæan Systema Naturæ, this species stands however as a variety of the short Sun-fish, *truncatus* β *Tetrodon Mola*. Bloch does seem to be acquainted with this truncated species : the short Sun-fish is described by that writer.



PLATE XLII.

PLEURONECTES MICROCEPHALUS.

SMALL HEADED, OR SMEAR DAB.

* PISCES THORACICI.

GENERIC CHARACTER.

Head small. Eyes spherical, both on the same side of the head, and near each other. Mouth arcuated. Jaws dentated, unequal. Gill-membrane with from four to seven rays. Gill-covers of three plates in general. Body compressed, carinated; upper side sub-convex: beneath flat and pale. Vent nearer the head.

SPECIFIC CHARACTER

AND

SYNONYMS.

Body oblong, head small, mouth diminutive, lateral line somewhat incurvated.

PLEURONECTES MICROCEPHALUS: corpore oblongo, capite parvo
ore minimo, linea laterali subincurvata.

Vraie Limandelle. *Duhamel Traité des Pech. T. 3. p. 2. sect. 9.*
pl. 6. fig. 3, 4.

This is a kind of Flounder that appears to form an intermediate link between the Sole and the Dab, partaking in some measure of the

PLATE XLII.

characters of both. We first observed one of this species in a trawling net, on the sandy shore of South Wales, among a parcel of Soles and other flat fish. Since that period we have seen it occasionally exposed for sale in the London markets, to which we are informed it is brought from Brighton, and other places on the coast of the Western counties.

The form of this fish is oblong: above, the colour is obscure, blackish, or dusky brown; beneath white, and both above and beneath is perfectly free from spots. In comparison with the size of the body the head is small, but in particular the mouth is remarkably so, and the lips are a little protruded. Exactly over the pectoral fin, the lateral line takes a very gradual curvature, after which it proceeds along the body to the tail in a straight direction.—This being the true Smear Dab, Mr. Pennant was certainly misinformed at the fishmongers in London, which he speaks of, where he was told a fish corresponding with the *Kit* of the Cornish fishermen, was commonly known in the Metropolis, by the name of Smear Dab. The Cornish Kit is not unknown to us, and we have reason to believe it to be one of those kinds of flat fish, that is scarcely ever brought to the London markets. So far also as our own enquiries have extended, the fishmongers call the species we are now describing, the Smear Dab, and do not seem to recognise any other fish by that name.

Neither of the described species of the *Pleuronectes* genus, in Gmelin's *Systema Naturæ*, answers to the description of our fish. That to which it appears to approach the nearest, is the *P. limanoides* of that Author, but in one very striking particular our species differs so essentially from that fish, that if it be described correctly, we have no hesitation in admitting them to be distinct. The mouth in limand-

PLATE XLII.

oides is stated to be of a large size, the upper-lip consisting of two bony parts, which may be protruded or retracted at the pleasure of the creature. In our fish there is no such contrivance in the upper lip; the mouth is small, and the fish does not possess the faculty of extending it to any very considerable length. Besides this, the fish is by no means distinguished by such an uncommon degree of roughness in the scales that invest the body, as to merit the appellation of "cor-pore aspero," for they are comparatively smooth. In the French edition of Bloch's Fishes, this kind is represented under the name of *La Plie rude*. This figure shews the scales to be both large and rough; the head comparatively of a great size: the eyes large and prominent: opening of the mouth wide, and the jaws furnished with many teeth.

Duhamel in his *Traité des Peches*, is the only author who seems to have known this fish, and described it with accuracy. He notices the strong affinity it bears both to the Sole and the Dab, observing very justly, that the body is wider in proportion to its length than that of the Sole, and on the other hand of a more elongated form than that of the Dab: his figures are well expressed, especially that of the upper surface, in which the characteristic diminutiveness of the mouth is well exemplified; the curvature of the lateral line over the pectoral fin is indeed rather faulty, in being too widely extended in its progress towards the head. Duhamel acquaints us that this is a scarce species on the coasts of France, being in many places entirely unknown.

In our fish the dorsal fin contains ninety rays: pectoral fin seven rays: ventral six rays: anal seventy-three rays: tail seventeen.

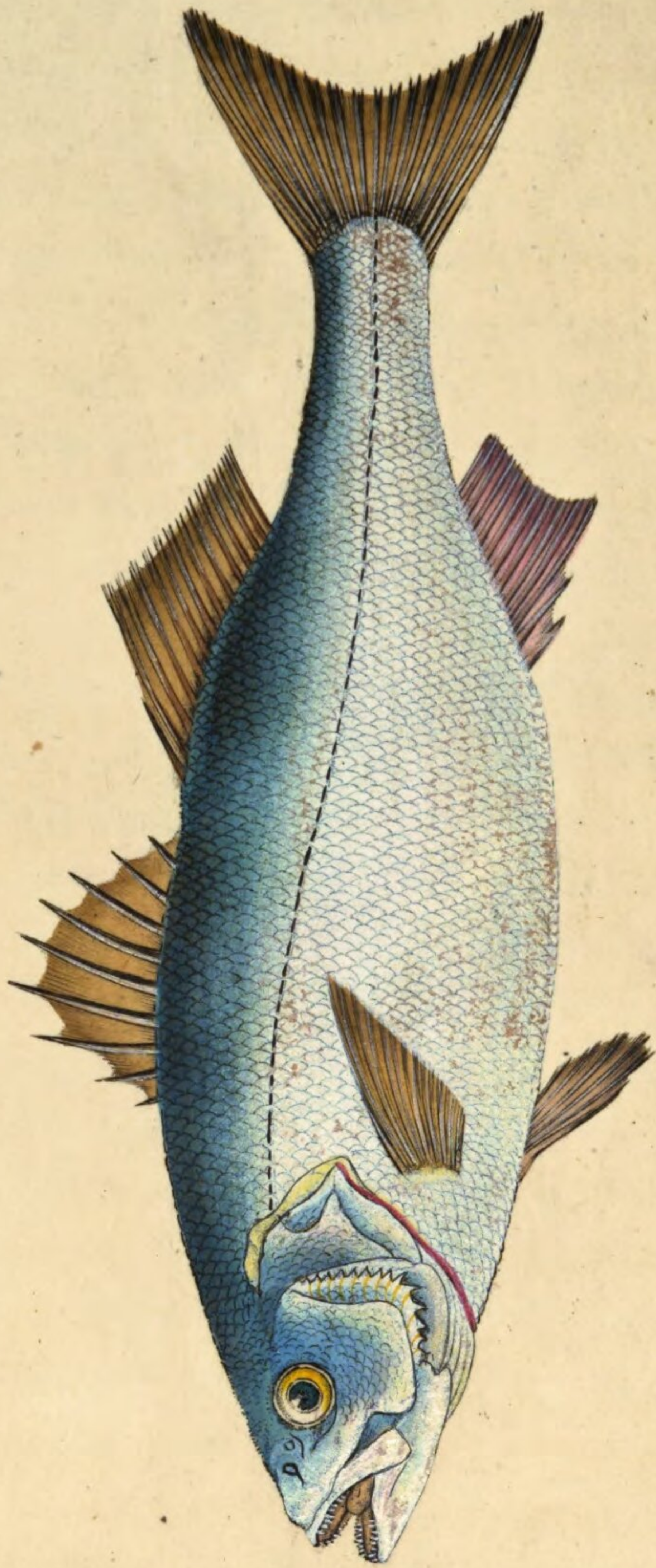


PLATE XLIII.

PERCA LABRAX.

BASSE.

* PISCES THORACICI.

GENERIC CHARACTER.

Jaws unequal. Teeth acute, and incurvated. Gill covers of three plates, scaly; the upper plate serrated. Seven rays in the gill-membrane. Lateral line arched with the back. Scales hard and rough. Fins spinous.

SPECIFIC CHARACTER

AND

SYNONYMS.

Second dorsal fin with fourteen rays: back dusky, blueish, belly silvery.

PERCA labrax: pinna dorsalis radiis quatuordecim dorso subfusco
cærulescenti abdomine argenteo.

PERCA LABRAX: pinnæ dorsalis secundæ radiis 14. *Linn. Syst.*

Nat. Mus. Ad. Fr. 2. p. 82.

PERCA PUNCTATA. *Gmel. Syst. Nat. 1311. sp. 4.*

PLATE XLIII.

PERCA radiis pinnæ dorsalis secundæ 13, ani 14. *Art. Gen. syn.* 69.

SCIÆNA LABRAX, Le Loup. *Bloch.*

During the summer months, this delicious fish is caught on several of the sea coasts, in the southern parts of England. At different times we have received this kind both from Devonshire and Cornwall, and also from the coast of Wales. Near the entrance of the Loughor river, that bends its course from the Bristol channel, along the westward of Glamorganshire, we have seen them in some abundance.

The Basse, we believe in point of size, very rarely exceeds the length of eighteen or twenty inches. The largest among those which have occurred to our notice, at least did not exceed those dimensions, and generally speaking, they were seldom above a foot or fifteen inches in length. That the Basse does sometimes attain to a vast size need not be disputed: Writers assure us, that it is known to grow to the length of several feet. Willughby speaks of its weighing fifteen pounds, and Duhamel tells us, that it is taken occasionally of double that weight, near the Isle of Noirmoutier, upon the coast of Brittany.

This fish is a native of the temperate parts of Europe. In the Mediterranean sea, the Basse is caught on the coast of Egypt, and the Grecian islands, and it is also met with as far north as Greenland. On the coast of Holland, there are stated fisheries for this species, which they call *See-Snoeck*. Ancient writers distinguish it by the name of Labrax and Lupus, or the Wolf, in allusion to its voracious appetites, its strength, activity, and general man-

PLATE XLIII.

ners. Worms of the testaceous tribes, and the smaller kinds of fish, are the principal food of this species.

Our specimen of the Basse has nine sharp spinous rays in the first dorsal fin: and fourteen soft rays in the second one: in the pectoral fin are eighteen rays: ventral six: anal fourteen: and caudal twenty-one.

PLATE XLIII.

Many of the testaceous tubes, and the smaller kinds of fish, are the principal food of this species.

Our specimen of the Boats has nine sharp spinous rays in the first dorsal fin; and fourteen soft rays in the second one; in the pectorals are five sharp rays; ventrals six; anal fourteen; and caudal twenty-one. The body is covered with small scales, and the head is covered with bony scutes. The eyes are large, and the mouth is small. The gills are small, and the operculum is large. The skin is smooth, and the color is brownish.

The Boats is a small fish, and is found in the shallow waters of the coast. It is a common fish, and is much valued for its food. The Boats is a very hardy fish, and is able to live in a variety of waters. It is a very active fish, and is able to swim very fast. The Boats is a very useful fish, and is much valued for its food.

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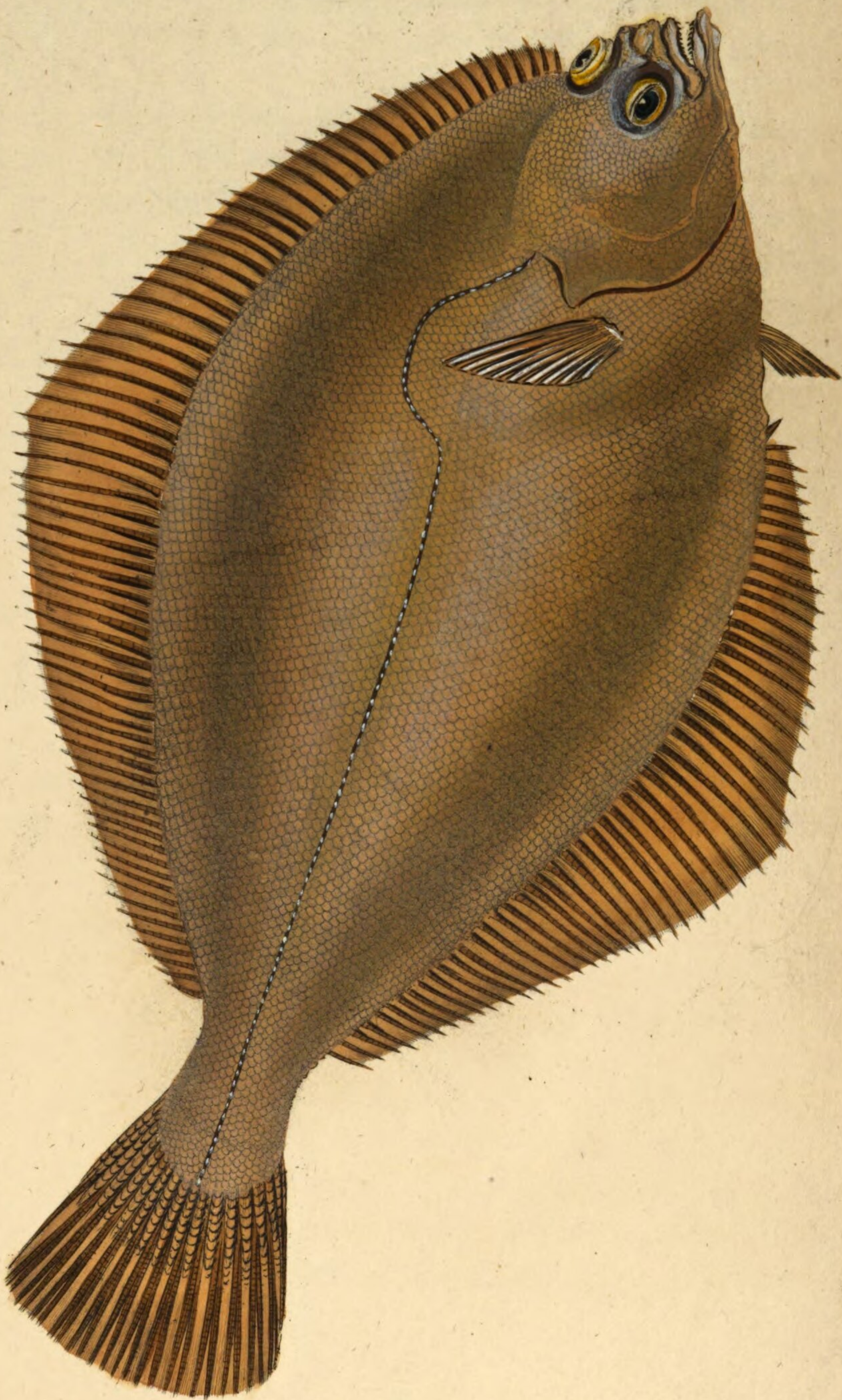


PLATE XLIV.

PLEURONECTES LIMANDA.

DAB.

* PISCES THORACICI.

GENERIC CHARACTER.

Head small. Eyes spherical, both on the same side of the head, and near each other. Mouth arcuated. Jaws dentated, unequal. Gill-membrane with from four to seven rays. Gill covers of three plates in general. Body compressed, carinated; upper side sub-convex: beneath flat and pale. Vent nearer the head.

SPECIFIC CHARACTER

AND

SYNONYMS.

Scales ciliated, spinules at the root of the dorsal and anal fin with obtuse teeth.

PLEURONECTES LIMANDA: squamis ciliatis, spinulis ad radicem pinnarum dorsi anique, dentibus obtusis.

*Linn. Mus. ad. Fr. 2. p. 68.—Gmel. 1231.
sp. 8.*

DAB *Penn. Brit. Zool. p. 230. sp. 105.*

The common Dab is an inhabitant of all the sandy shores in the Northern Seas of Europe. In England, as in other places, it is ob-

PLATE XLIV.

served to be less abundant than the common Plaise, to which it approaches in some respects very nearly. The form in both is almost the same, but the colour of the common Dab is generally of a lighter colour, and invariably destitute of those remarkable red spots, which are usually found on the upper surface of the Plaise. Sometimes the Dab is dappled obscurely with dark brown. The under-side is white.

This fish is in the highest state of perfection for the table during Spring, when they are preferred by some to the Plaise, or even to the Flounder. Late in the month of May, or beginning of June they spawn, and after that time the flesh becomes flabby, soft, and of an ill flavour. The Dab feeds upon the young of other fishes, and on crabs and other marine insects which inhabit sandy shores. Its usual length is five, six, or seven inches. In one specimen which we examined, the dorsal fin contained seventy-three rays: pectoral fin eleven: ventral six: anal fifty-three; tail fifteen.



PLATE XLV.

GASTEROSTEUS SPINACHIA.

FIFTEEN SPINED STICKLEBACK.

* PISCES THORACICI.

GENERIC CHARACTER.

Head oblong, smooth; jaws armed with small teeth: tongue short, and obtuse: palate smooth: eyes moderate, very little prominent and lateral. Branchiostegous membrane with three, six, and sometimes seven rays: operculum of two pieces, rounded and striated. Body carinated on each side and covered with bony plates: distinct spines before the dorsal fin: lateral line straight: ventral behind the pectoral fins, but above the sternum.

SPECIFIC CHARACTER

AND

SYNONYMS.

Dorsal spines fifteen.

GASTEROSTEUS SPINACHIA: spinis dorsalibus quinquedecim. *Linn.*

Fn. Suec. 338. *Gmel. Syst. Nat.* 1327.

sp. 10.

Gasterosteus pentagonus. *Mus. Ad. Fr.* p. 34. *Klein. miss.*

pisc. 4. p. 48. n. 1.

PLATE XLV.

Aculeatus vel pungitius marinus longus. *Ray. pisc. p. 145. n. 15.*
Will. Ichth. p. 340. t. X. 13. f. 2. app.
p. 23.

Grande épinoche. *Bloch.* Fifteen spined Stickleback. *Penn. Brit.*
Zool. p. 263. sp. 131.

Three species of this genus are natives of this country, the most common of which are the *aculeatus* and *pungitius*, two kinds that are found chiefly in rivulets, brooks, and other fresh waters. *Gasterosteus spinachia*, the third species, is an inhabitant of the sea, and is never found in fresh waters, except by accident when it happens to stray to a short distance up rivers, that have an immediate communication with the marine element. We have observed the fry of this latter species on the sea coast of Anglesea, especially in the bay of Holyhead, from whence we may conclude, that it breeds contiguous to the shore. A specimen of the full grown fish about five inches in length occurred also in this spot.

There is every reason to presume that this species, although abundant in the northern parts of Europe, is very far from common on the sea coasts of this country. In the Baltic and the North Sea, they are observed to be most frequent: Upon the coast of Holland, they appear sometimes in such vast numbers, as to be made use of for manuring the land. They are also caught for the sake of an oil that is expressed from them, which is used for burning in lamps, and other domestic purposes. The fish itself is seldom eaten except by the lower orders of people.

PLATE XLV.

The head of this fish is of a remarkable tubular form ; the body slender : back armed with fifteen shark spines, and the lateral line composed of small, somewhat prominent, and pointed scales. General colour above olive, variable, and tinged with gold, beneath white. In the individual specimen, we are describing the second dorsal fin, or that situated at the extremity of the dorsal spines, contains seven rays : pectoral fin ten rays ; the ventral fins, or rather spines, consists each of an acute bony process : in the anal fin are eight rays, the first of which is short and spinous ; and the tail contains twelve rays.

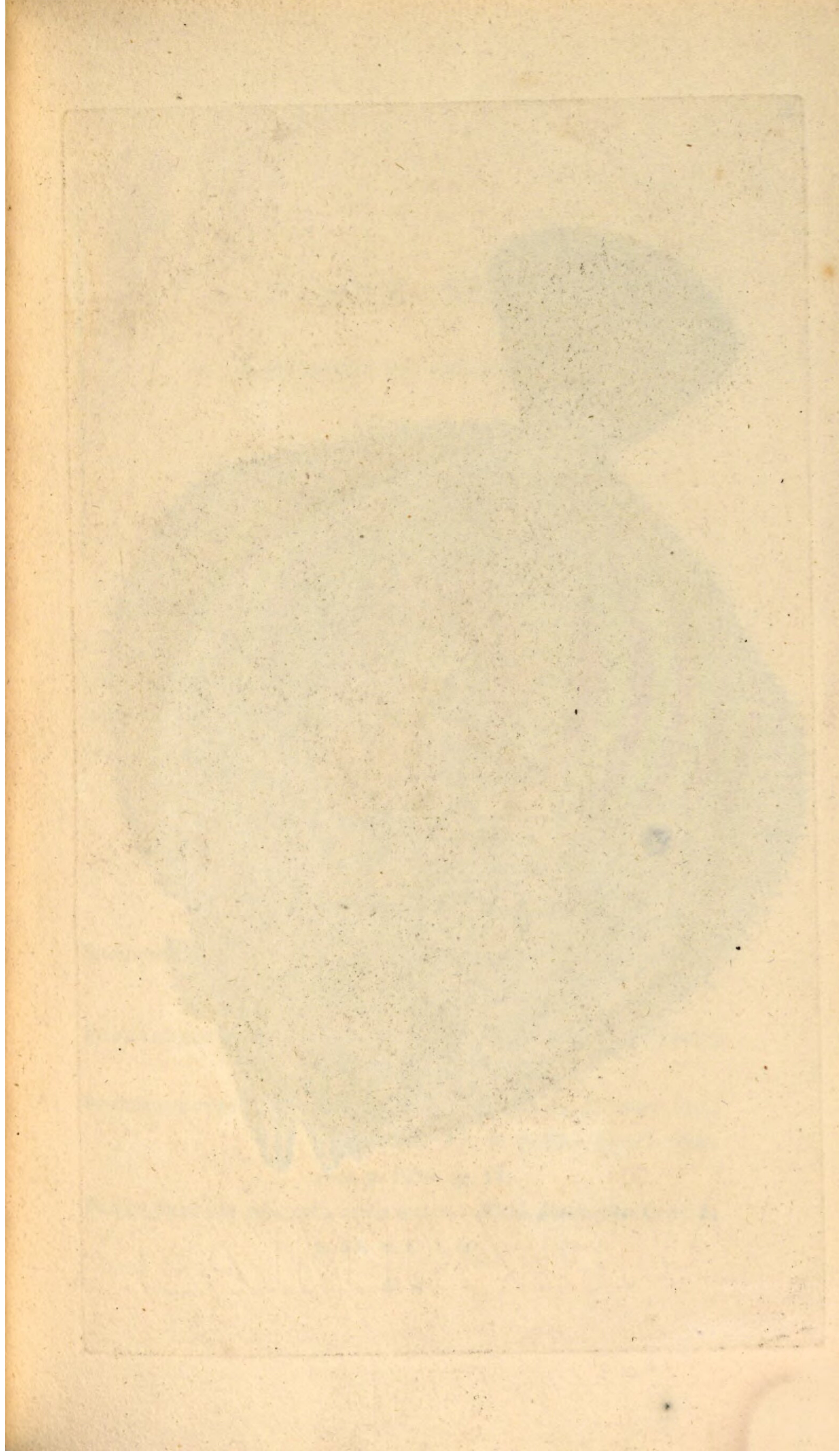




PLATE XLVI.

PLEURONECTES MAXIMUS.

TURBOT.

* *PISCES THORACICI.*

GENERIC CHARACTER.

Head small. Eyes spherical, both on the same side of the head, and near each other. Mouth arcuated. Jaws dentated, unequal. Gill-membrane with from four to seven rays. Gill-covers of three plates in general. Body compressed, carinated; upper side sub-convex: beneath flat and pale. Vent nearer the head.

SPECIFIC CHARACTER

AND

SYNONYMS.

Body rotundate, above griseous, variegated with fuscous, and tuberculated.

PLEURONECTES MAXIMUS: corpore rotundato supra griseo fusco-variegato tuberculato.

PLEURONECTES MAXIMUS: corpore aspero. *Linn. Fn. Suec.* 325.

—*Mus. Ad. Fr.* 2. p. 69.—*Gmel. Syst. Nat.* p. 1236. sp. 14.

PLEURONECTES tuberculis osseis scaber. *Bloch Fisch. Deutschl.* 2. p. 53. n. 8. t. 49.

PLATE XLVI.

Rhombus aculeatus nigricans, &c. et Rhombus cineritius, aculeis
asperrimus, &c. *Klein. Miss. pisc.* 4.
p. 34. *n.* 1. *et* 35. *n.* 2. *t.* 8. *f.* 1, 2.
t. 9. *f.* 1.

The Turbot is to be easily discriminated from the analogous kinds of flounders, by the many sub-acute tubercles, with which both the upper, and the under surface of this fish are beset. There is besides a remarkable rotundity in the outline of this species, by which it may be known. The colour on the upper surface is yellow, varied, clouded and spotted with darker brown. The skin is covered with scales, but those are extremely small. It should be also observed, that the tubercles on the upper surface are larger and more numerous than those on the under-side, the colour of which is perfectly white. The peculiar excellence of the Turbot is so very generally acknowledged, that it might be thought superfluous on our part to speak in commendation of it.

There is a species of this tribe of flat fishes, called by English writers the Pearl, the Pleuronectes Rhombus of Linnæus, which very much resembles the Turbot, but the surface of it is uniformly destitute of the prominent tubercles, which are so very obvious on that fish. The flesh of this is inferior in point of firmness, delicacy and flavour to that of Turbot, for which it is sometimes sold.

Upon the information of Bloch, and various other Ichthyologists, who have entered minutely into the history of this fish, we may conceive the Turbot to be a very general inhabitant of all the Northern Seas, and also of the Mediterranean. Many of our own coasts

PLATE XLVI.

abounds with them, yet upon the whole there are few fisheries established for its capture, that are carried on with any proper degree of spirit; those on the eastern side of the island perhaps excepted. At Scarborough, we are assured by an intelligent friend, Mr. Travis *

* To the reader who may be desirous of obtaining information respecting the Turbot Fishery, the following extract from a letter communicated by the father of this gentleman to Mr. Pennant, and afterwards inserted in the British Zoology, may not prove unacceptable, as being the most correct and ample we have been able to obtain upon this subject.

“ When they (the fishermen) go out to fish, each man is provided with three lines : each man's lines are fairly coiled upon a flat, oblong piece of wickerwork ; the hooks being baited, and placed very regularly in the centre of the coil : each line is furnished with fourteen score of hooks, at the distance of six feet two inches from each other : the hooks are fastened to the lines upon sneads of twisted horse-hair, seventeen inches in length : When fishing, there are always three men in each cobble, and consequently nine of these lines are fastened together, and used as one line, extending in length near three miles, and furnished with 2520 hooks ; an anchor and a buoy are fixed at the first end of the line, and one more at each end of each man's lines, in all four anchors, which are commonly perforated stones, and four buoys made of leather and cork : the line is always laid across the current : the tides of flood and ebb continue an equal time upon our coast, and when undisturbed by winds, run each way about six hours : they are so rapid that the fishermen can only shoot and haul their lines at each turn of the tide, and therefore the lines always remain on the ground about six hours : the same rapidity of the tide prevents their using hand-lines, and therefore two of the people commonly wrap themselves in the sail and sleep, while the other keeps a strict look-out, for fear of being run down by ships, and to observe the weather ; for storms often rise so suddenly, that it is with extreme difficulty they can escape to shore, leaving their lines behind. The cobble is twenty feet six inches long, and five feet extreme breadth : it is about one ton burthen, rowed with three pair of oars, and admirably constructed for the purposes of encountering a mountainous sea : they hoist sail when the wind suits.”

PLATE XLVI.

of that place, that the Turbot Fishery is considered there as a very important concern.

The Turbot grows to a large size, being sometimes caught of fifteen or twenty pounds weight; there are instances of its being found even of thirty pounds weight, but Turbots of this size are far from common.

In the dorsal fin of one specimen we counted sixty rays: pectoral fin twelve: ventral six: anal forty-three: and in the tail seventeen.

The Turbot, it may be added, is commonly taken with the hook and line, baited principally with small pieces of other fish, especially herrings. The Dutch fishermen make use of the smaller Lamprey, that is found in the river Thames, about Mortlake, vast quantities of which they purchase of the English fishermen for this purpose, as well as for baiting the apparatus employed in their extensive Cod-Fisheries in the North Seas.

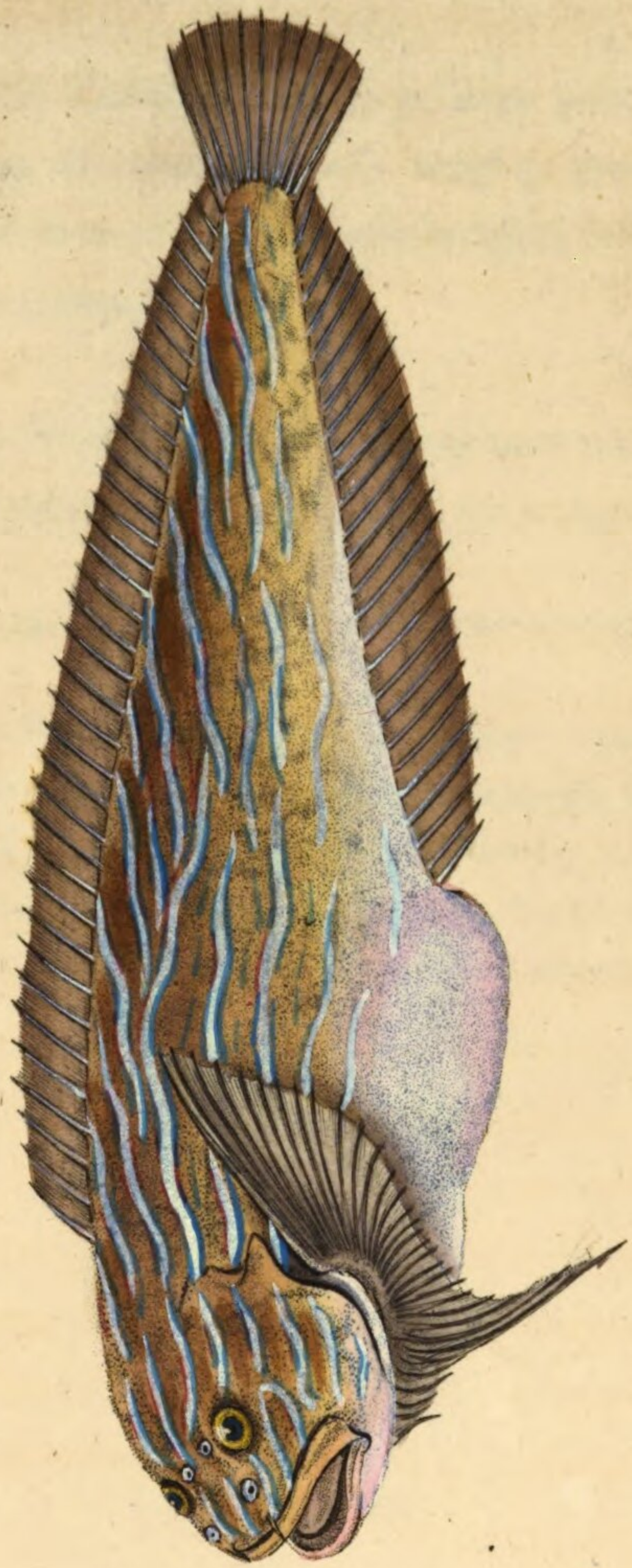


PLATE XLVII.

CYCLOPTERUS LIPARIS.

UNCTUOUS LUMP-SUCKER.

* PISCES BRANCHIOSTEGI.

GENERIC CHARACTER.

Head obtuse, mouth in the anterior part: tongue short and thick, jaws furnished with numerous minute sharp teeth. Branchostegous membrane with four rays: cover of a single piece. Body short, thick, destitute of scales. Ventral fins connected: the sucker between them.

SPECIFIC CHARACTER

AND

SYNONYMS.

Body naked: dorsal, anal, and tail fin united.

CYCLOPTERUS LIPARIS: corpore nudo, pinnis dorsali anali caudalique unitis. *Art. Syn.* p. 117. n. 1.—
Gmel. Syst. Nat. 1477. sp. 3.—et *Cyclopterus lineatus.* 1478. sp. 8.

Cyclopterus pinna pectorali-barbiformi. *Bloch. Aus. Fisch.* 1.
p. 48. n. 2. t. 123. f. 3. 4.

Cyclogaster. *Gronov. Mus.* 2. 157. *Act. helv.* 4. p. 265. t. 23.

SEA SNAIL. *Wil. Icht. App.* 17. *Raii syn. pisc.* 74.

UNCTUOUS LUMP-SUCKER. *Penn. Brit. Zool.* 3. p. 135. n. 58.

PLATE XLVII.

Last winter a small fish of this curious kind presented itself by accident to our observation, amongst a parcel of sprats brought for sale to the fish-market at Billingsgate. Notwithstanding the extreme singularity of its appearance, we were led in the first instance to consider it only as a strongly marked variety of *Cyclopterus liparis*, and this opinion we are inclined to retain after comparing it accurately with other specimens, that are indisputably of the *liparis* species.

When perfectly fresh, the head and body of this fish were strongly marked with longitudinal streaks and waves of white, edged with blue, and disposed on a ground of testaceous or rather chesnut colour. It seemed, therefore, to accord pretty exactly with the *Cyclopterus lineatus* of Gmelin, a species described by that author on the authority of a paper written by Iwan Lepechin, and inserted in the 18th volume of the Transactions of the Royal Society of Petersburg. Our conjectures in this respect were confirmed on adverting to that paper, for there cannot remain a doubt of the *Cyclopterus lineatus* of Lepechin, being in reality of the same kind as our fish. This point decided, it only rests with us to examine in what particulars the *lineatus* differs specifically from *liparis*, before we presume to announce the discovery of a new British species, however gratifying such discovery would be to our assiduous perseverance, in endeavouring to ascertain the native products of our country.

Cyclopterus liparis, it should be premised, differs in no respect in the general figure, from *Cyclopterus lineatus*. The body being naked, and the dorsal, anal, and caudal fin being united, constitutes the character of this species; or in the language of Artedi and Gmelin, “corpore nudo, pinnis dorsali anali caudalique unitis.”

PLATE XLVII.

There is nothing in this character expressly different from that which Lepechin, and on his authority Gmelin assigns to his *lineatus* “*corpore nudo, pinnis dorsali, et anali sensim in caudalem excurrentibus,*” because in both the dorsal and anal fins are connected with the tail, and the trivial distinction of those fins running gradually into the tail, is insufficient to mark the species, as the same circumstance is observable in *Cyclopterus liparis*.

Lepechin has thus far failed in endeavouring to assign to his species *lineatus*, such a character as may distinguish his fish from *liparis*. But before we intrude our individual opinion in preference to that of Lepechin, which has been received as correct by one of the most distinguished societies in Europe, we shall examine the general description, in order to discover if possible some peculiarities in the *Cyclopterus lineatus* of that writer, that are not observable in *C. liparis*; and these we think might be readily detected in the detail he has given, if there really existed any difference between them:

The colour of *lineatus* is described as being of a chesnut colour,* except the belly, and part immediately surrounding it: the throat pale, and tuberculated: lower lip faint rosy: and both the head and body marked with pretty broad whitish lines, some of which are straight, and the others undulated. Although this be not very commonly the appearance of *liparis*, we have the authority of several writers, for asserting that the back and sides are not unfrequently variegated, spotted, and striated longitudinally with brown.

* Color totius piscis castaneus, excepto ventre cum vicina, gula pallidioribus tuberculisque labri inferioris dilute roseis. Per caput atque latera corporis ducuntur lineæ longitudinales, sat latæ et partim rectæ, partim undulatæ ad caudam convergentes, exalbiolæ, &c. I. LEPECH.

PLATE XLVII.

In the latter case, the brown stripes would leave the intermediate spaces of a still lighter colour, and in those instances where the fish proved to be strongly marked, would give it the same appearance as the lineatus of Lepechin. We have observed liparis to differ very considerably in colour at different seasons of the year, as well as in the various stages of their growth. Small specimens have occurred in which the sides and belly were white; in some pale yellow, and in others rosy; the sides of the head usually partaking of the same tints as those of the body. In a fish which we find to be so liable to variation, both in respect of its colours and markings, we do not think the longitudinal striæ on lineatus to be sufficient to characterise it as a species distinct from liparis, or even to authorise us in believing it to be any more than an accidental variety of that fish.

But before we conclude with this opinion, our attention reverts to what another author has said of this fish. Bloch in the Nouveau Dictionnaire d'Histoire Naturelle, calls this species *Le Cycloptère Rayé* a un seul rayon à la membrane des branchies, &c. In our specimen this character seemed to exist, there appearing to be really only one ray in the gill-membrane, but on carefully inserting the end of the finger under the gills, the membrane expanded, and displayed seven branchiostegous rays, as in liparis. The specific character which Bloch gives for the last mentioned fish, namely, the barbiform appearance of the pectoral fins, is also very clearly to be observed in both.

The Unctuous Lump-sucker is a native of the northern parts of Europe. Those found on our own coasts seldom exceed the length of four or five inches, but such as frequent the shores of Greenland and Kamtschatka, are oftentimes of a size, far more considerable,

PLATE XLVII.

being from a foot to eighteen inches in length: The flesh of this fish is remarkably soft and oily, and is never eaten except by the inhabitants of Greenland, who devour it with avidity, and esteem it most delicious.

In the dorsal fin we found thirty-six rays: pectoral thirty-two: anal twenty-six: tail twelve.

PLATE XLIX

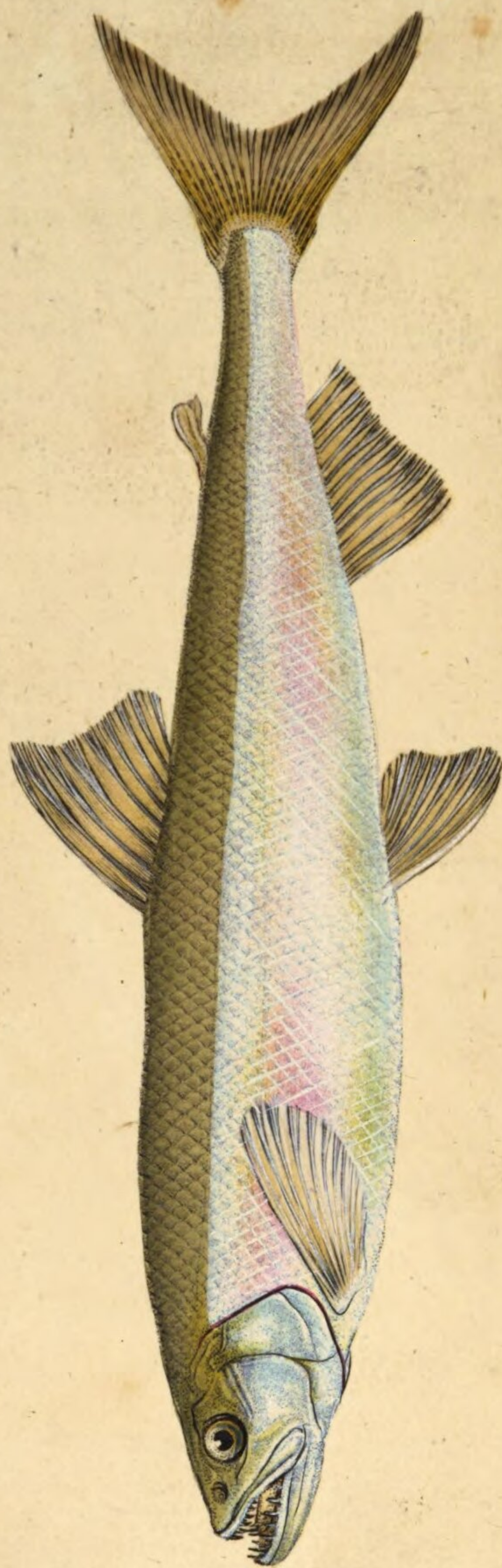


PLATE XLVIII.

SALMO EPERLANUS.

SMELT.

* PISCES ADOMINALES.

GENERIC CHARACTER.

Head smooth, and compressed. Mouth large: lips small: tongue white, cartilaginous, and moveable: teeth in the jaws, and upon the tongue. Eyes moderate, and lateral. Branchiostegous membrane with from four to twelve rays; cover of three plates. Body long, covered with rounded and very finely striated scales: back convex: lateral line straight, and nearest to the back: posterior dorsal fin fleshy without rays: ventral fin of many rays.

SPECIFIC CHARACTER.

Lower jaw longest: seventeen rays in the anal fin.

SALMO EPERLANUS. maxilla inferiore longiore, pinna ani radiis 17.

Bloch. Fisch. Deutsch.

SALMO EPERLANUS: capite diaphano, radiis pinnæ ani 17. *Fn.*

Suec. 350.—*Art. gen.* 10. *syn.* 21. *spec.*

45.—*Gron. Mus.* 1. p. 18. n. 49.—*Gmel.*

Syst. Nat. 1375. *sp.* 13.

Trutta edentula tota argentea, semi-diaphana, &c. *Klein miss.*

pisc. 5. p. 20. t. 4. f. 3, 4.

Eperlanus fluviatilis. *Gesn. Thierb.* p. 189.

PLATE XLVIII.

If we may assent to the very probable conjectures of Mr. Pennant, Dr. Bloch and other Ichthyologists, the Smelt is to be considered as a species exclusively confined to the North of Europe. These authors say that it appears in vast shoals in the North Seas, and in the Baltic, but that it never enters the Mediterranean Sea, or is seen further to the southward in its periodical migrations from the northern regions.

The Smelt is found in the seas surrounding our own island, at all seasons of the year. Towards the close of Autumn, they commonly ascend from the sea up those rivers which they frequent, in order to deposit their spawn, and continue in those places till March or April, when having finally accomplished the purpose of their visit, they return again to the sea. This however ought only be understood as the time of their appearance, and emigration in certain rivers, for in this respect the Smelt is extremely irregular; remaining in some five or six months, and in others scarcely so many weeks. The principal fishery for the Smelt commences about March in the temperate parts of Europe.

Dr. Bloch makes two species of the Common Smelt, one of which he retains under the name of *Eperlanus*, the other he calls *Eperlano-marinus*. Perhaps there may be, notwithstanding, more propriety in believing with Gmelin, that the *Eperlanus*, and *Der Stint* of Bloch is rather a variety than a species distinct from the larger kind. The length of the small sort is from two to three inches; the other most commonly exceeds four inches in length, and sometimes measures six, and even seven, or eight inches. Mr. Pennant speaks of one, the largest he had ever heard of, that was thirteen inches in length, and weighed half a pound. We have seen Smelts of a very large size

PLATE XLVIII.

taken in the River Thames, though certainly none so considerable in this respect as that recorded by Mr. Pennant. The Smelts mentioned in Narborough's Voyage, that are said to be taken in the Straits of Magellan, some of which measured twenty inches in length, and eight in circumference, were most likely not of this species.

The smell of this fish has an highly odoriferous fragrance peculiar to itself; which has been compared by some to that of cucumbers recently gathered from the garden, and by others it is thought to resemble rather that of violets. Yet this idea does not prevail universally, for there are many persons to whom the fragrance arising either from cucumbers or violets are extremely grateful who are disgusted with that of Smelts. Linnæus tells us there is found in the Baltic Sea two varieties of the Smelt, one of which he calls Nors, and speaks of its having a very foetid smell, which in the early Spring, when the peasants come to buy it, fills all the streets of Upsal with the smell: adding, that at this season of the year, agues prevail there. Bloch has been erroneously misled into the belief that the streets of London are sometimes affected by the stench of Smelts in the same manner.

In the first dorsal fin of the Smelt delineated in the Plate, we counted eleven rays: in the pectoral fin twelve rays: ventral eight: anal fourteen: caudal twenty-one.



PLATE XLVIII

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ACCORDING TO

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180	Black-bass, <i>Morone chrysops</i>
181	Black-bass, <i>Morone chrysops</i>
182	Black-bass, <i>Morone chrysops</i>
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189	Black-bass, <i>Morone chrysops</i>
190	Black-bass, <i>Morone chrysops</i>
191	Black-bass, <i>Morone chrysops</i>
192	Black-bass, <i>Morone chrysops</i>
193	Black-bass, <i>Morone chrysops</i>
194	Black-bass, <i>Morone chrysops</i>
195	Black-bass, <i>Morone chrysops</i>
196	Black-bass, <i>Morone chrysops</i>
197	Black-bass, <i>Morone chrysops</i>
198	Black-bass, <i>Morone chrysops</i>
199	Black-bass, <i>Morone chrysops</i>
200	Black-bass, <i>Morone chrysops</i>

Donovan, Edward, 1768-1837

The natural history of British fishes including scientific and general descriptions of the most interesting species and an extensive selection of accurately finished coloured plates, taken entirely from original drawings, purposely made from the specimens in a recent state, and for the most
Bd.: 2

London (1803)

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